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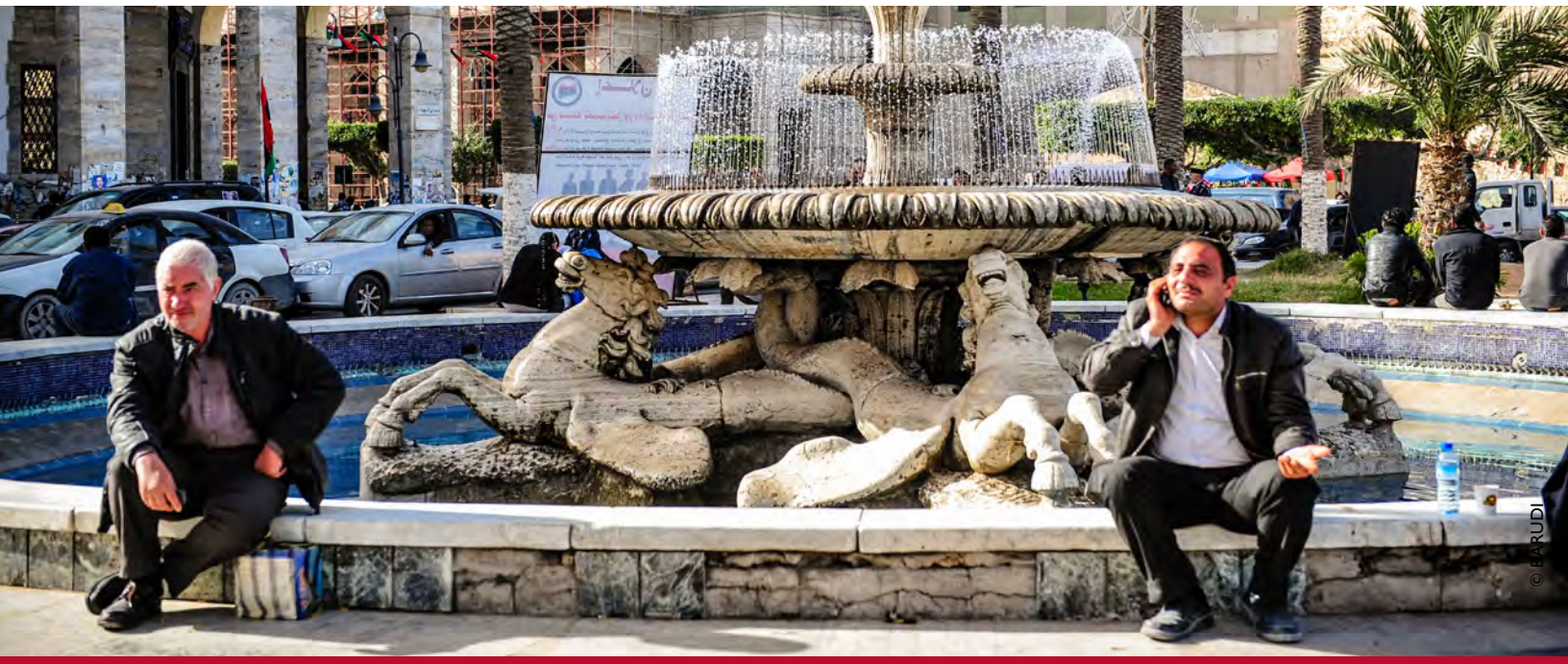

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DIGITAL ECOSYSTEM COUNTRY ASSESSMENT (DECA)

Libya

NOVEMBER 2022

DigitalFrontiers
SCALING DIGITAL DEVELOPMENT

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DIGITAL ECOSYSTEM COUNTRY ASSESSMENT (DECA)

Libya

November 2022

ACKNOWLEDGEMENTS

This report reflects insights from the Digital Ecosystem Country Assessment (DECA), led by the U.S. Agency for International Development's (USAID's) Technology Division within the Innovation, Technology, and Research Hub (ITR) of the Bureau for Development, Democracy, and Innovation (DDI), with support from DAI's Digital Frontiers project. Raiyan Kabir, Elizabeth Santucci, Jill Shemin, and Craig Jolley authored the report. Tahani Elmogrbi provided Libya country expertise and insights. Ann Procter provided copy editing support and Miya Su Rowe provided report design and graphics via Digital Frontiers. The authors are grateful to Eleana Baskouta for providing critical support during the interview phase.

The authors extend their appreciation to all USAID staff who participated in internal discussions and review of this report. We thank these individuals from USAID and the U.S. Department of State who reviewed this report: Pedro Campo-Boue, Randolph Flay, Sara Hamida, Patricia Morales, Justin Selb, and Rabab Shamayleh. We also thank the following individuals for their detailed review: Chanel Adikuono, Diana Boncheva-Gooley, David Bornstein, Stan Byers, Jaclyn Carlsen, Taha Gaya, Paul Nelson, Michelle Parker, Laura Sigelmann, Kanchana Sthanumurthy, and Forrest Wilhoit.

The authors extend their deep gratitude to the USAID/Libya points of contact, Christine MacAulay and Sara Werth for providing critical insight and facilitating key informant interviews.

The authors also extend their sincere thanks to all of the interviewees who made this assessment possible.

The report authors accept responsibility for any errors or inaccuracies in this report.

This publication was produced by the Digital Frontiers Project under Cooperative Agreement AID-OAA-A-17-00033 at the request of the United States Agency for International Development.

COVER PHOTO: Sohail Nakhooda, January 2013

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KEY TERMS

ACRONYMS

2G	Second-generation
3G	Third-generation
4G	Fourth-generation
5G	Fifth-generation
A4AI	Alliance for Affordable Internet
ACLED	Armed Conflict Location Event Database
AFI	Alliance for Financial Inclusion
AfricaCERT	Africa Computer Emergency Response Team
AML/CFT	Anti-Money Laundering and Countering Financial Terrorism
API	Application Programming Interface
ASYCUDA	Automated System for Customs Data
CBL	Central Bank of Libya
CCMCE	Central Commission of Municipal Council Elections
ccTLD	Country Code Top-Level Domain
CGAP	World Bank Consultative Group to Aid the Poor
CSO	Civil Society Organizations
DECA	Digital Ecosystem Country Assessment
DFS	Digital Financial Services
DNS	Domain Name System
DSL	Digital Subscriber Line
ECTN	Electronic Cargo Tracking Note
EU	European Union
FCC	Federal Communications Commission
FinTech	Financial Technology
FIRST	Forum of Incident and Response Security Teams
FOI	Freedom of Information
FTTP	Fiber-to-the-Premises
FTTx	Fiber To The X
FWA	Fixed Wireless Access
GACI	General Authority for Communications and Informatics
GECOL	General Electricity Company of Libya
GIA	General Information Authority
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GNA	Government of National Accord
GNC	General National Congress
GNI	Gross National Income
GNU	Government of National Unity
GPTC	General Posts and Telecommunications Company
GSMA	*Global System for Mobile Association*
HoR	House of Representatives
HNEC	High National Elections Commission
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	Information and Communications Technology
IDP	Internally Displaced People
IFES	International Foundation for Electoral Systems
IGF	Internet Governance Forum
IMF	International Monetary Fund
IoT	Internet of Things
IP	Internet Protocol
ISIL	Islamic State of Iraq and the Levant
ISP	Internet Service Provider
ITU	International Telecommunication Union
ITU-T	International Telecommunication Union Telecommunication Standardization Sector
ITU-IMPACT	ITU – International Multilateral Partnership Against Cyber Threats
IXP	Internet Exchange Point
KYC	Know Your Customer
L2D	Learn to Discern
LELSA	USAID Libya Elections and Legislative Strengthening Activity
LGBTQI+	Lesbian, Gay, Bisexual, Transgender, Queer and Intersex persons
LGCS	USAID Local Governance and Civil Society [Taqarib]
Libya-CERT	Libya Computer Emergency Response Team

LITC	Libyan International Telecom Company
LNA	Libyan National Army
LOICT	Libyan Organization for Information and Communications Technology
LPFM	USAID Libya Public Financial Management Activity
LPTIC	Libyan Post, Telecommunications and Information Technology Company
LTE	Long-Term Evolution
LTT	Libya Telecom and Technology Company
LYD	Libyan Dinar
MENA	Middle East and North Africa
MNO	Mobile Network Operator
MOE	Ministry of Education
MSME	Micro, small, and medium-sized enterprise
NDI	National Democratic Institute
NISSA	National Information Security and Safety Authority
NGBN	Next Generation Broadband Network
NGO	Non-Governmental Organization
NOC	National Oil Corporation
NSA	Non-standalone
OIC-CERT	Organization of Islamic Cooperation – Computer Emergency Response Team
P2P	Person to Person
PAVO	Peace Against Violence Organization
POS	Point of Sale
PSP	Payment Service Provider
QR	Quick Response
SA	Standalone
SDG	Sustainable Development Goals
SME	Small and Medium-sized Enterprises
SMS	Short Message Service
STEM	Science, Technology, Engineering, and Mathematics
TVWS	TV White Space
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNSMIL	United Nations Support Mission in Libya
USAID	United States Agency for International Development
USD	US Dollar
USSD	Unstructured Supplementary Service Data
USF	Universal Service Fund
USG	United States Government
VAS	Value Added Service
WiMAX	Worldwide Interoperability for Microwave Access
WTO	World Trade Organization
STEM	Science, Technology, Engineering, and Mathematics
TA	Technical Assistance
TVWS	TV White Space
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNSMIL	United Nations Support Mission in Libya
USAID	United States Agency for International Development
USD	US Dollar
USSD	Unstructured Supplementary Service Data
USF	Universal Service Fund
USG	United States Government
UTRAMS	Unified Technical Request and Mission Support
VAS	Value Added Service
WiMAX	Worldwide Interoperability for Microwave Access
WTO	World Trade Organization
ZTE	Zhongxing Telecommunication Equipment Corporation

Executive Summary

BACKGROUND

Several key factors have shaped Libya's current digital ecosystem and will influence its evolution in coming years. The most prominent is the decade-long period of conflict beginning with the 2011 revolution. During this time, intermittent violence, geographic divisions, and political paralysis have consumed attention and resources that might otherwise have gone toward modernization and reform of the Libyan state and economy. The effects of conflict can be felt throughout Libya's digital ecosystem, including the destruction of physical infrastructure assets, geographic division of key institutions including the Central Bank of Libya, and an online environment polluted by disinformation and foreign influence operations.

Libya's digital ecosystem developed well before 2011, and the effects of the Gaddafi era are still in evidence. Historians have traced Libya's current fragmentation to the personalization of the state and society under Gaddafi, along with longstanding underinvestment in public institutions. Libya's legislature has found it very difficult to update the legal basis for the digital economy, creating regulatory confusion and an atmosphere of mistrust.

There are grounds for optimism. Despite the challenges facing it, Libya's digital economy has grown dramatically. Companies have tailored their offerings for a local audience and found innovative workarounds to regulatory gridlock. Even as social media platforms face concerns about disinformation and foreign manipulation, they are also home to a new generation of independent online journalists, activists, and political commentators. There is no shortage of allies working for positive change.

USAID'S APPROACH TO DIGITAL DEVELOPMENT

USAID's Digital Strategy launched in April 2020 to achieve and sustain open, secure, and inclusive digital ecosystems that contribute to development and humanitarian assistance outcomes through the responsible use of digital technology.

The Digital Ecosystem Country Assessment (DECA), a flagship initiative of the Digital Strategy, informs the development, design, and implementation of USAID's strategies, projects, and activities. The DECA looks at three pillars of a country's digital ecosystem: (1) digital infrastructure and adoption; (2) digital society, rights, and governance; and (3) the digital economy. The DECA aims to inform how USAID/Libya and the international development community understands, works with, and strengthens the country's digital ecosystem.

KEY FINDINGS AND RECOMMENDATIONS

CROSS-CUTTING

FINDINGS

- Libyan government institutions have uneven cybersecurity capabilities and there is no information publicly available on cybersecurity strategies, data privacy laws or authority, or effective cyber crisis management.
- Civil society organizations (CSOs) and journalists have limited capacity to respond to cyber attacks and online harassment, often leading to self-censorship.

RELEVANT RECOMMENDATIONS

1. Strengthen cybersecurity capacity through civil society engagement and workforce development
2. Embed digital literacy throughout development programs
3. Promote the Principles for Digital Development with donors, partners, and the government

PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION

FINDINGS

- Conflict and political instability have disrupted regular legislative processes, delaying much-needed updates to laws (including the Telecommunications Act) since 2011.
- Connectivity infrastructure is fairly well developed in coastal urban areas, but lags in Libya's sparsely populated southern region.
- COVID-19 has accelerated the adoption of digital tools and services across sectors; however Libyans are reluctant to adopt new tools due to unfamiliarity with specific platforms, lack of trust, lack of digital literacy, or when they feel these tools and services are unnecessary.
- Many Libyan internet users are "Facebook literate," but are less familiar with more advanced digital tools such as online payments.

RELEVANT RECOMMENDATIONS

4. Expand connectivity to the last-mile with infrastructure financing reform and new connectivity technologies
5. Support information and communications technology (ICT) workforce development through university partnerships and upskilling initiatives

PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

FINDINGS

- Libya's decade-long conflict and instability have limited the HoR's ability to clarify roles, and responsibilities, and to pass new legislation. Laws from the previous regime are still technically in force.
- Government digital initiatives are often siloed in separate Ministries. Recent events have shown greater openness to multistakeholder engagement, particularly around e-payments and promotion of Libya's ICT industry.
- The government is prioritizing digitalization; however, there are significant barriers to execution. These are tied to inadequate digital infrastructure, a piecemeal approach rather than an overall strategy, and insufficient legal and regulatory frameworks.
- Facebook dominates Libya's information and media landscape to a greater extent than in most countries. It is the primary news source for many Libyans and can allow for conversations between citizens and CSOs or municipal governments. However, the platform also creates risks such as widespread mis-, dis-, and malinformation and online harassment of activists, journalists, and marginalized groups.

RELEVANT RECOMMENDATIONS

6. Counter online disinformation by partnering with Libyan change agents and engaging platform companies
7. Promote reconciliation by leveraging citizen journalism and Libya's storytelling culture on social media platforms
8. Bolster digital government initiatives through research, intergovernmental exchanges, donor coordination, and embedded technical advisors
9. Ensure that future plans for biometric voter registration at the High National Elections Commission (HNEC) account for human rights and privacy issues
10. Support legal reforms to promote digital development and the protection of human rights online
11. Promote coordination through a multistakeholder internet governance forum and a government-wide Office of Digital Initiatives

PILLAR 3: DIGITAL ECONOMY

FINDINGS

- Libya lacks fundamental legal enablers such as e-signature and intellectual property laws.
- The Central Bank of Libya (CBL) plays a critical role in the enabling environment and has faced a number of financial, monetary, and leadership crises that have affected Libya's banking system and eroded consumer trust.
- The current payments infrastructure is fragmented in both banking and e-wallet markets, preventing a seamless payment experience and inhibiting uptake.
- The formal education system and ICT training provided by international donor agencies are largely outdated and do not meet current industry needs.
- Libya's private sector is demonstrating its ability to innovate with workaround solutions to market limitations.

RELEVANT RECOMMENDATIONS

12. Promote inclusion and transparency in CBL's digital finance reform efforts through support to strategy and public communications efforts
13. Establish capacity building and peer learning mechanisms for the CBL driven by best practices and regional examples
14. Support the CBL in facilitating the shift to electronic payments and in implementing the new national payment system project

ROADMAP FOR THE REPORT

Section 1 provides background on the DECA framework and goals.

Section 2 presents key findings on Libya's digital ecosystem. The section is organized into three subsections by DECA pillar: (1) digital infrastructure and adoption; (2) digital society, rights and governance; and (3) digital economy.

Section 3 provides recommendations on how the international development community can leverage and support the digital ecosystem to achieve improved development outcomes.

Navigation tip: The navigation bar in the footer throughout this report helps you move between sections. Dark blue text will indicate the current section you are in.

SECTION 1:

About this Assessment

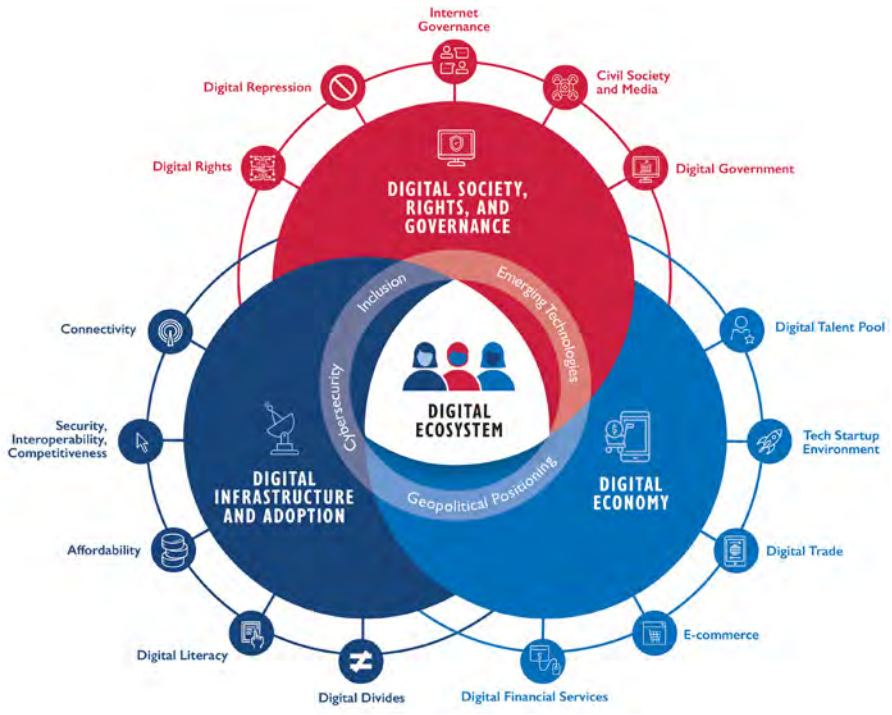
USAID's Digital Strategy aims to improve measurable development and humanitarian assistance outcomes through the responsible use of digital technology and to strengthen the openness, inclusiveness, and security of country digital ecosystems. The Digital Strategy (and the DECA) are part of USAID's holistic approach to helping achieve the United Nation (UN)'s Sustainable Development Goals (SDGs).

As part of the Digital Strategy implementation, the DECA examines three broad areas to support understanding the opportunities and challenges in a country's digital ecosystem:

1. Digital Infrastructure and Adoption
2. Digital Society, Rights, and Governance
3. Digital Economy

The Libya DECA took place between March and August 2021. It encompassed desk research, consultations with USAID/Libya, and about eight weeks of virtual key informant interviews with 58 stakeholders from civil society, academia, the private and public sectors, international development organizations, and USAID/Libya offices. It is important to note that some key government agencies (particularly the Libyan Post Telecommunication and Information Technology Company) have experienced leadership changes since interviews were completed in August 2021. Analysis of their future plans or policy directions will require confirmation with more current contacts.

FIGURE 1: USAID's Digital Ecosystem Framework



SECTION 2:

DECA Findings

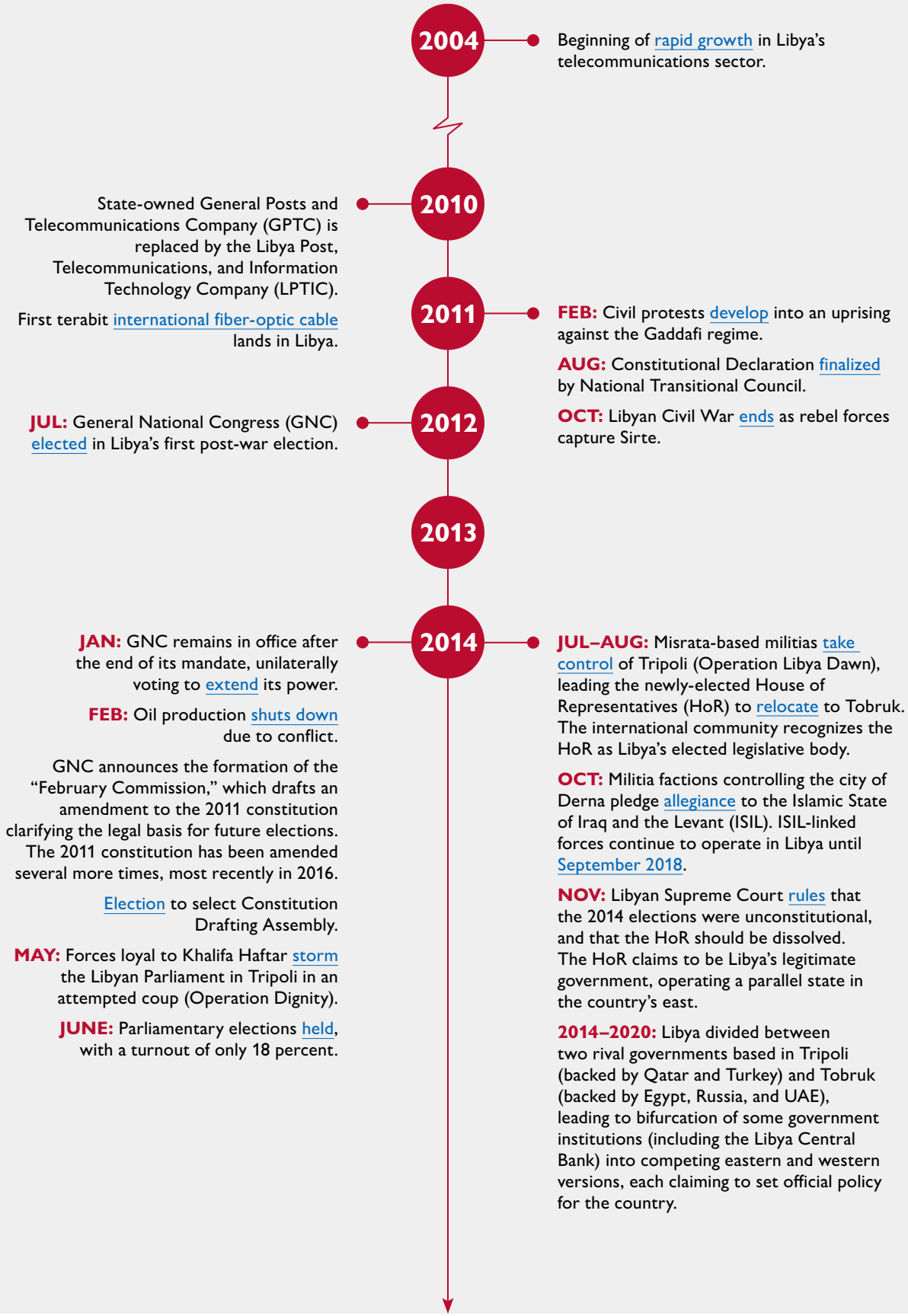
Libya's path to digitalization has been prolonged and rocky. In contrast to *digitization*—the conversion of documents into an electronic format—*digitalization* denotes a more profound shift in work processes and organizational culture. Such sweeping changes are never easy, especially when a significant portion of the country's priorities and resources has been shifted into surviving a decade of protracted conflict. Legacy digital tools and infrastructure remaining from the Gaddafi era are in need of upgrades and are reportedly underutilized.

Aside from legislative hurdles, digitalization has also brought other challenges. As connectivity expands, it is crucial to ensure that no one is left behind. With the immense popularity of social media in Libya, the fight against disinformation and online violations of human rights—especially those of women and marginalized communities—will continue. New digital applications and platforms will require guidelines and legislation on data protection. Greater digital literacy will encourage the adoption of digital tools and services, and a strengthened digital talent pool will help diversify Libya's economy.

Despite these challenges, there have been promising advances in Libya's digital ecosystem. Upgrades and expansions of both mobile and fixed broadband connectivity have allowed more Libyans to get online. While the government is still siloed in its approach to digitalization, some agencies have made significant progress. Innovators, particularly young Libyans, are introducing new e-commerce services and exploring workarounds to barriers in the digital financial system. COVID-19 has accelerated digital innovation and demonstrated the potential for digitalization in Libya.

Libya's journey toward digital transformation is commendable in the light of years of conflict and disruptions. If the next round of elections leads to a successful political transition, there is hope for an accelerated path to digitalization in the not so distant future.

BOX 1: Timeline of recent events in Libya



2015

MAR: HoR confirms Khalifa Haftar as commander of Libya's armed forces. The armed forces later split into the HoR-aligned Libyan National Army (LNA), led by Haftar, and the Tripoli-aligned armed forces.

DEC: A peace agreement leads to the formation of the Government of National Accord (GNA) which is quickly recognized by the international community.

2016

AUG: The HoR votes to reject the GNA, and cooperation between the western and eastern factions breaks down.

FALL: Oil production resumes after oil fields are recaptured by LNA and handed over to the National Oil Corporation (NOC).

2017

MAR: First fourth-generation (4G) mobile services launched in Libya.

APR: Shutdown of oil fields by armed groups triggers currency devaluation and hyperinflation.

2018

JUL: Adoption of draft constitution by Constitution Drafting Assembly. The 2017 constitution was never put to a national referendum and the (amended) 2011 constitution remains in force.

2019

OCT: Al Madar launches first fifth-generation (5G) pilot in Tripoli.

2020

MAR: First COVID-19 case confirmed in Libya.

AUG: Major street protests in Tripoli, motivated by poor living conditions, corruption, and the growing COVID-19 pandemic.

OCT: UN-brokered ceasefire agreement between the Government of National Unity (GNU) and the LNA.

2020

MAR: GNU is selected by the Libyan Political Dialogue Forum, intended to unify the eastern and western governments.

OCT: Leadership at LPTIC is dismissed and replaced with a new governing board.

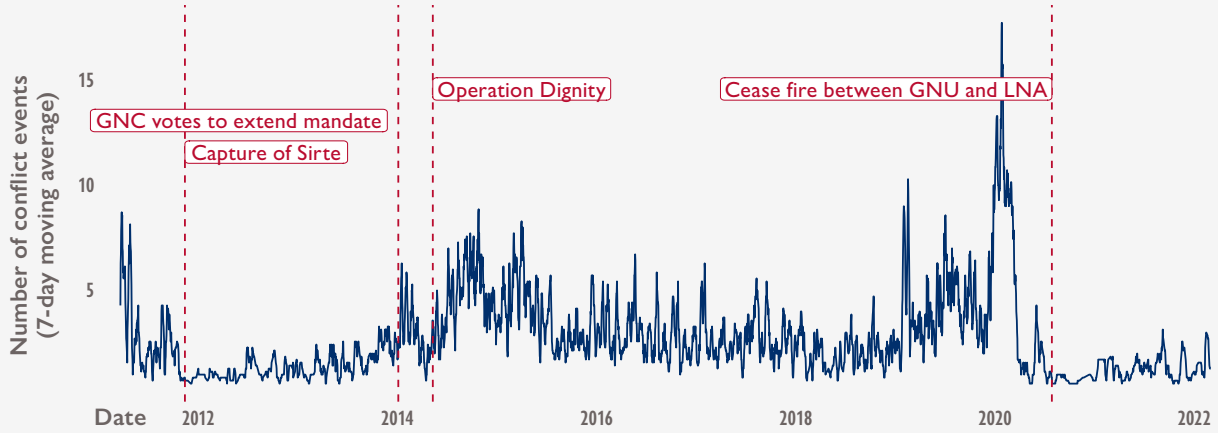
Controversial anti-cybercrime bill passed by HoR.

DEC: Presidential election postponed until 2022.

2022

JUNE: Date set by LPDF roadmap for expiration of the transitional phase, assuming that elections would be held in December 2021.

The plot below summarizes publicly available data from the Armed Conflict Location Event Database (ACLED). ACLED tracks conflict events (e.g., battles, protests, riots, explosions, violence against civilians, and strategic developments). Looking at the total number of events is one way to capture changes in the intensity of the conflict.



Source: ACLED

PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION

Digital Infrastructure and Adoption refers to the resources that make digital systems possible and how individuals and organizations gain access to and use these resources. Digital infrastructure includes geographic network coverage, network performance, internet bandwidth, and spectrum allocation, as well as telecom market dynamics around security, interoperability, and competitiveness. This pillar also examines behavioral, social, and physical barriers and opportunities for equitable adoption (such as affordability and digital literacy[1])—who uses digital technologies, how, and where.

KEY TAKEAWAYS: DIGITAL INFRASTRUCTURE AND ADOPTION

- Conflict and political instability have disrupted regular legislative processes, delaying much-needed updates to laws (including the Telecommunications Act) since 2011.
- Connectivity infrastructure is fairly well developed in coastal urban areas, but lags in Libya's sparsely populated southern region.
- COVID-19 has accelerated the adoption of digital tools and services across sectors; however Libyans are reluctant to adopt new tools due to unfamiliarity with specific platforms, lack of trust, lack of digital literacy, or when they feel these tools and services are unnecessary.
- Many Libyan internet users are "Facebook literate," but are less familiar with more advanced digital tools such as online payments.

RELEVANT RECOMMENDATIONS

1. Expand connectivity to the last-mile with infrastructure financing reform and new connectivity technologies.
2. Support information and communications technology (ICT) workforce development through university partnerships and upskilling initiatives.
3. [Cross-cutting] Embed digital literacy throughout development programs

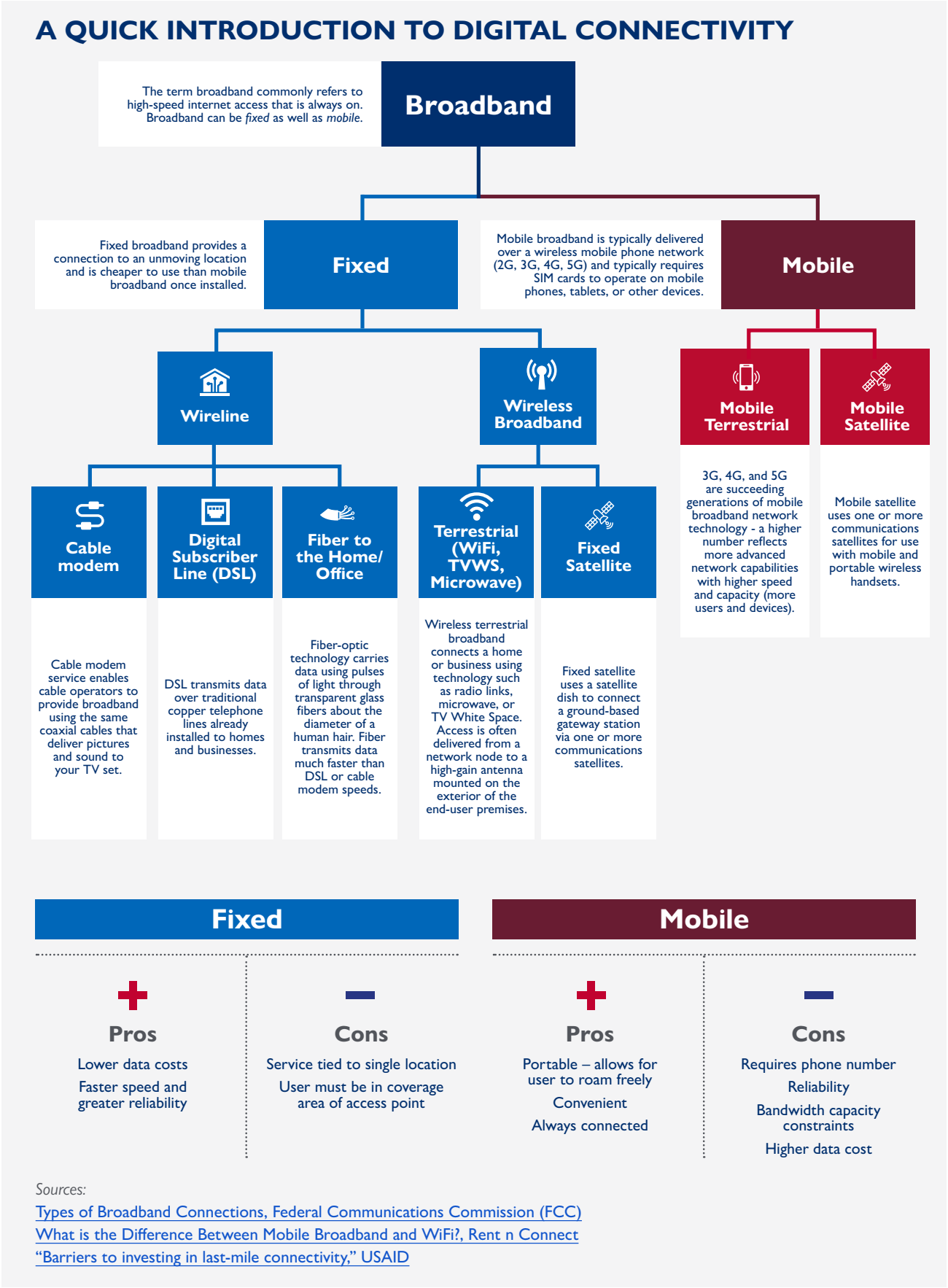
INTRODUCTION

Digital connectivity has expanded dramatically in Libya, with technologically savvy Libya Post, Telecommunications, and Information Technology Company (LPTIC) at the helm. The telecommunications sector is largely dominated by state-owned enterprises, and LPTIC is the holding company for the most important ones. Since 2011, protracted conflict has largely consumed the attention of the HoR, resulting in a regulatory environment that has not kept pace with changes in technology and the economy.

The COVID-19 pandemic accelerated the development of digital tools and services. Digital adaptation to the pandemic has demonstrated the potential for distance learning, digital finance, and e-commerce. At the same time, barriers such as inadequate electricity, geographic inequities in connectivity, low levels of digital literacy, and reluctance to adopt new digital tools and services continue to hamper development.

1 Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social, and political life. This may include competencies variously referred to as computer literacy, information and communication technology literacy, information literacy, and media literacy.

FIGURE 2: A quick introduction to digital connectivity



Sources:

Types of Broadband Connections, Federal Communications Commission (FCC)

What is the Difference Between Mobile Broadband and WiFi?, Rent n Connect

"Barriers to investing in last-mile connectivity," USAID

2.1.1. A LAY OF THE (BROADBAND) LAND

The telecommunications sector in Libya was predominantly state controlled prior to 2007, at which point the sector was restructured to run on a commercial basis as part of a broader move toward liberalization.[2] In 2010, the state-owned General Posts and Telecommunications Company (GPTC) was dissolved and its investments transferred to the state-owned LPTIC. Today, the sector is regulated by the General Authority for Communication and Informatics (GACI), formerly known as the General Telecom Authority (GTA).[3] While LPTIC largely drives operations for the telecommunications sector, GACI is responsible for policymaking and regulations. LPTIC is the dominant player in Libya's telecommunications space as a holding company for eight subsidiaries, each with a specific mandate within the sector.

TABLE 1: Libya Post, Telecommunications and Information Technology Company (LPTIC) and its subsidiaries

ENTITY	ROLE
Libya Post, Telecommunications and Information Technology Company (LPTIC)	Established in 2005. Primary holding company of all major telecommunications companies in Libya. Sovereign fund predominantly focused[4] on the ICT sector and set up so subsidiaries run commercially. Three key mandates: • Govern and manage ICT sector • Act as an enabler of digital transformation and work toward enabling a digital economy • Build capacity among young professional Libyans to prepare them for the market
Libyana Mobile Phone Company	Mobile Network Operator
Almadar Aljadeed Company	Mobile Network Operator
Libya Telecom and Technology (LTT)	First ever (and still largely dominant) internet service provider in Libya. Hosts national data and provides stopgap solutions in rural areas where penetration by mobile broadband operators is difficult. LTT provides residential connectivity services, primarily via Digital Subscriber Line (DSL) or fixed wireless services.
Hatif Libya Company	Operates and maintains state-owned connectivity infrastructure. Owner and manager of Next Generation Broadband Networks (NGBN) and terrestrial networks
Aljeel Aljadeed for Technology	Niche company that offers satellite as well as fixed and wireless internet services. Uses Hatif Libya's fiber backbone to sell connectivity services to private internet service providers (ISPs) and some government facilities.
Libya International Telecom Company (LITC)	Manages Libya's international telecommunication network, including undersea cable landing points and connections across borders.
Post Libya Company	National postal service
Al Bunya	Real estate company; owns LPTIC's towers and physical infrastructure

Libya's telecommunications sector has grown since 2004 with improvements in fourth-generation (4G) mobile broadband and more recent expansion of fiber broadband. However, growth has been slow, and signs of improvement sporadic, due to barriers in the enabling environment. The development of telecommunications

2 LPTIC is commercial in the sense that it earns profits, operates somewhat independently, and pays taxes. However, it is still quasi state-owned which means final decisions must be in line with Government of Libya strategies.

3 Public sector, Interview by the DECA team, April 2021, online.

4 A Sovereign Wealth Fund is a state-owned investment fund or entity commonly established from fiscal surpluses or other funds generated by the government.

infrastructure and policy has faced numerous hurdles due to ongoing conflict. Foundational laws, such as the 2010 Commercial Law for the telecommunications sector, are outdated. The development of proposed amendments or updates has been severely constrained due to the HoR's focus on security and conflict issues.

In 2014, a committee formed by the Ministry of Communications and Informatics drafted a much needed updated Telecommunications Act that would create an independent Telecommunication Regulatory Authority to oversee the industry. Due to legislative turmoil, it has not yet been considered by the HoR. At the time of its introduction, the business community saw the draft act as a glimmer of hope, and GACI remains eager to see this legislation advance once there is legislative stability. LPTIC also favors passing the draft act and views an updated regulatory framework as a catalyst for reform, as well as an enabler of foreign direct investment and private sector-driven growth and innovation.

KEY TERMS | BOX 1: Spectrum, ISPs, and MNOs

Radio Spectrum refers to the range of frequencies of electromagnetic radiation used to deliver radio transmissions. A critical function of telecommunications sector regulatory authorities is to designate specific frequency ranges (or bands) for different purposes, including telecommunications as well as applications such as radio astronomy or other industrial uses. Some bands (e.g., WiFi) are *unlicensed*, meaning that anyone can use them without seeking explicit prior permission.[5] Licensed spectrum requires users (e.g., mobile network operators or FM radio broadcasters) to secure a regulator's approval before use. Licenses are typically assigned through spectrum auctions, which seek to establish the economic value of spectrum as a finite natural resource.

Internet Service Providers (ISPs) deliver access to end users using both fixed-line and wireless technologies. Wireless ISPs (especially those in rural areas) often try to take advantage of low licensing and equipment costs by delivering service using unlicensed spectrum. ISPs range in size and scope from small local providers to providers with international or global reach.

Mobile Network Operators (MNOs) provide voice and data services primarily through wireless terrestrial networks. MNOs typically utilize licensed spectrum bands which, due to the fact that they are not shared, can deliver a higher quality, more reliable (and more cost-intensive) service.

The key difference between ISPs and MNOs is that MNOs provide internet service through a particular medium—licensed spectrum. ISPs deliver internet service through other means, including fixed-line connections and unlicensed spectrum (such as WiFi).

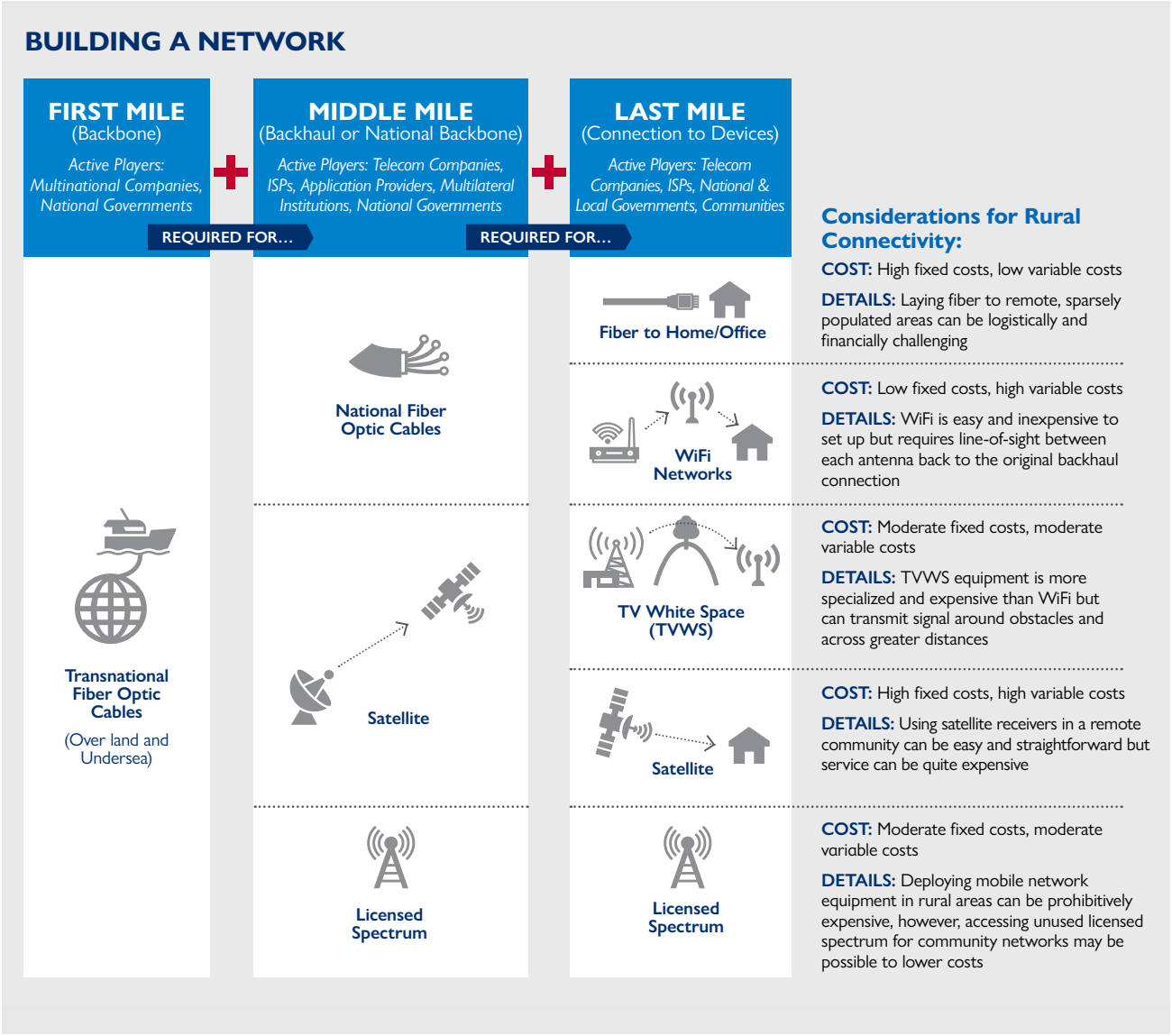
GROWTH AND INEQUITY IN FIXED BROADBAND

Libya's fiber-optic network can be separated into three levels: international cables (mostly submarine) that connect Libya to the outside world (the first mile); the terrestrial backbone network that connects Libyan towns and cities to one another (the middle mile); and the last-mile network that connects to homes and businesses (see Figure 3). The first terabit international fiber-optic cable[6] was introduced in Libya in 2010, followed by a second in 2013.

5 While permissions are not required for unlicensed spectrum use, users are typically limited to technical parameters (such as transmission power and antenna specifications).

6 A terabit is a measurement for 1 trillion bits or pieces of binary data. A terabit international fiber-optic cable can exchange data at roughly 1 terabit/second, 1,000 times faster than a gigabit cable.

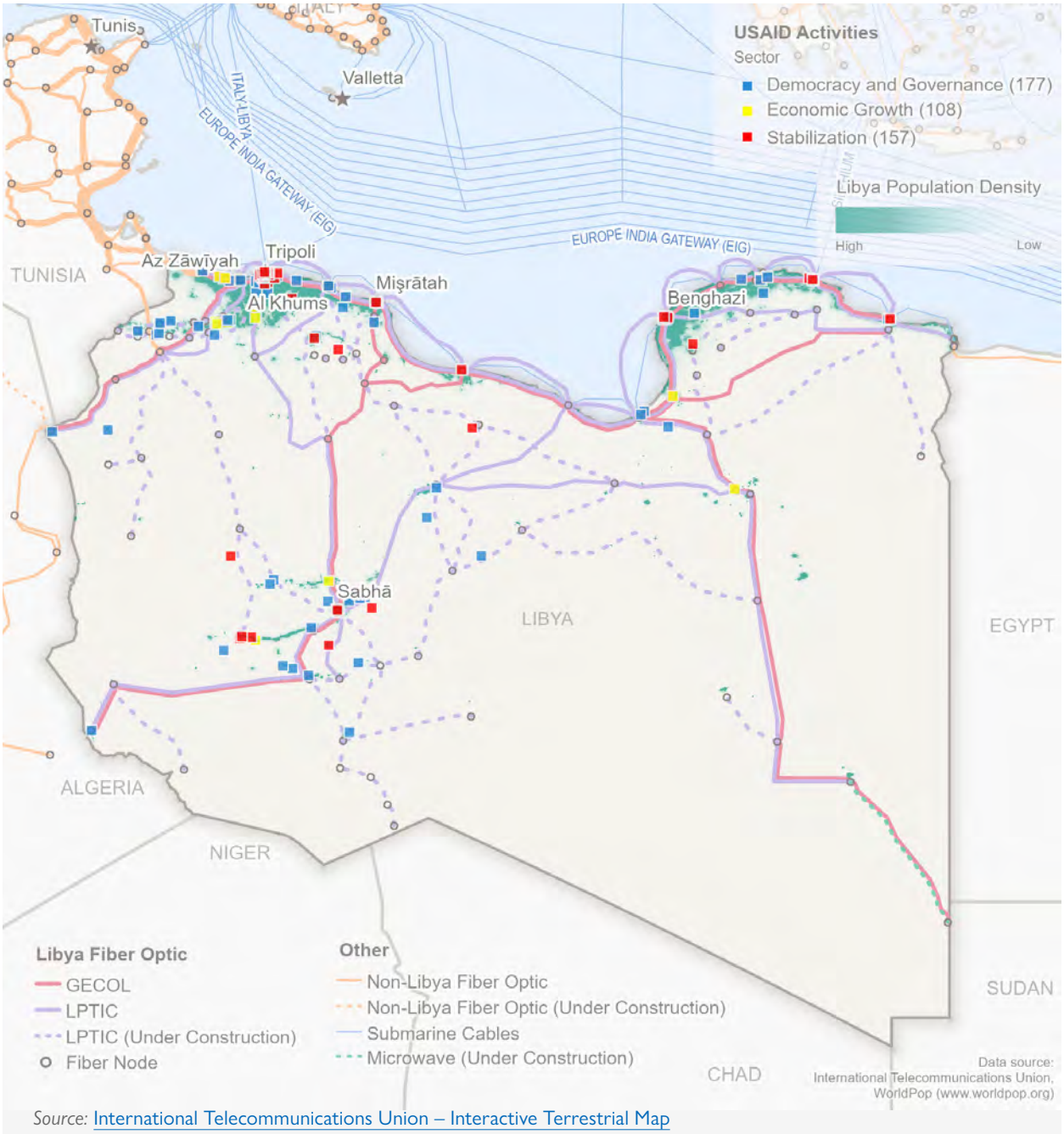
FIGURE 3: Building a network



Libya's fiber backbone network, referred to as the Next Generation Broadband Network (NGBN), is primarily owned and managed by Hatif Libya, The company provides this infrastructure to the MNOs (Libyana and Al Madar) and LTT, and also works with private ISPs. The NGBN fiber network runs about 13,000-14,000 km nationwide through towns and cities with a population of over 5,000. LPTIC claims that construction of the network is almost 96 percent complete. The fiber backbone infrastructure is strong in densely populated, urban areas where a majority of Libyans reside. However, experts claim that the fiber-optic backbone is old and in need of upgrades, leading to poor quality of service.[7]

7 Government agency, Interview by the DECA team, April 2021, online.

FIGURE 4: Libya's fiber-optic backbone network and USAID programs



Source: International Telecommunications Union – Interactive Terrestrial Map

Note: USAID/Libya activity locations in the map represent data as of October 2021.

Several new fiber lines are planned or under construction in the south of Libya. Historically, southern and rural areas have been underserved by connectivity infrastructure. LPTIC and its subsidiaries acknowledge this and attribute this gap to security disruptions affecting network physical infrastructure. Frequent power outages require telecom companies to use diesel generators and batteries as backup systems. Fuel shortages and high prices in the south make it expensive for companies to operate and maintain networks. The lack of a functioning Universal Service Fund (USF) means that the government is unable to subsidize the cost of running fiber between widely separated communities in southern Libya.[8]

8 Government agencies, Interview by the DECA team, March 2021, online.

KEY TERMS | BOX 2: Universal Service Fund

A Universal Service Fund (USF) is a mechanism designed to promote network infrastructure development in areas that commercial access providers deem uneconomical. USFs subsidize programs through contributions from telecommunications operators. USF funds are often applied to help de-risk or otherwise complement network investments in underserved or unserved areas. In many cases, USFs target projects that serve schools, hospitals, and other anchor institutions where demand for services can be aggregated.

Today, most Libyans get onto the internet through mobile broadband. Fixed broadband can improve speed and reliability and is crucial for businesses and institutions that need more than a 4G smartphone connection. This will require improvements to Libya's national backbone (middle mile in Figure 3) and fiber connections to homes and offices (last-mile in Figure 3).

In addition to the fiber backbone owned by LPTIC, the General Electricity Company of Libya (GECOL) owns a parallel backbone (red lines in Figure 4). According to interviewees, one idea to increase GECOL's revenue is to take this fiber network out of GECOL's control and put it up for franchise or for sale. This is part of a long-term strategy implemented through USAID's Libya Public Financial Management Project and can support more efficient utilization of backbone assets.

Libya is home to one of Africa's first last-mile fiber deployments, and expansion continues. LPTIC's planned expansion of NGBN has not yet been executed due to the conflict. The biggest challenge for fiber broadband expansion is in rural areas. As such, Libya continues to rely on lower bandwidth technologies[9] to fill the gaps, but this results in poor service.

The importance of expanding last-mile and rural fixed broadband coverage is clear, but stakeholders differ on the best path forward. LPTIC interviewees are intrigued by new technologies, such as fifth-generation (5G) fixed wireless access (FWA) that might substitute for traditional fiber in some cases (see Box 2). Other stakeholders harbor doubts about the short-term viability of 5G in Libya and prefer to focus on 4G expansion.

9 These include DSL copper lines, fixed wireless services (e.g., microwave and WiMax), and satellite broadband. Satellite connectivity is the most expensive and is used primarily for remote oil and gas facilities.

BOX 2: What is Fixed Wireless Access (FWA)?

As GSMA emphasizes, the digital divide cannot be closed simply by providing new internet connections. To yield its full benefit, connectivity must be fast enough to accommodate advanced services such as multimedia and social communications. Fixed wireless solutions may be able to provide cost-effective connectivity to households that current infrastructure cannot reach. Focusing on capital expenditures alone, last-mile fiber costs $500–$1,000 per subscriber, whereas fixed wireless networks cost about $100–$400 per subscriber.

Fixed Wireless Access (FWA) provides primary broadband access (4G and 5G) through wireless networks, typically from a base station to one or more stationary customer endpoints. This approach enables network operators to deliver broadband access service to suburban and rural areas, supporting home and business applications where fiber is prohibitively expensive to lay and maintain. In terms of functionality, the role of FWA is comparable to fiber; both are connectivity solutions for the last-mile.

In order to reliably transfer large volumes of data, networks must be dense. Fiber densification is costly to implement (especially fiber to the last-mile) due to construction and civil engineering, and the involvement of multiple stakeholders (e.g., property owners, road and pavement owners). According to a GSMA report, the last hundred meters of fiber may account for as much as 90 percent of the total cost. FWA approaches have not been deployed at national scale, but may provide an easier and sometimes cheaper route to network densification.

A COUNTRY WITHOUT INTERNET EXCHANGE POINTS

An internet exchange point (IXP) is the physical infrastructure through which ISPs and content delivery networks connect and exchange internet traffic. IXPs shorten the physical distance data needs to travel. In a healthy digital economy, dozens, if not hundreds, of IXPs are created by either independent organizations or consortia of network operators.

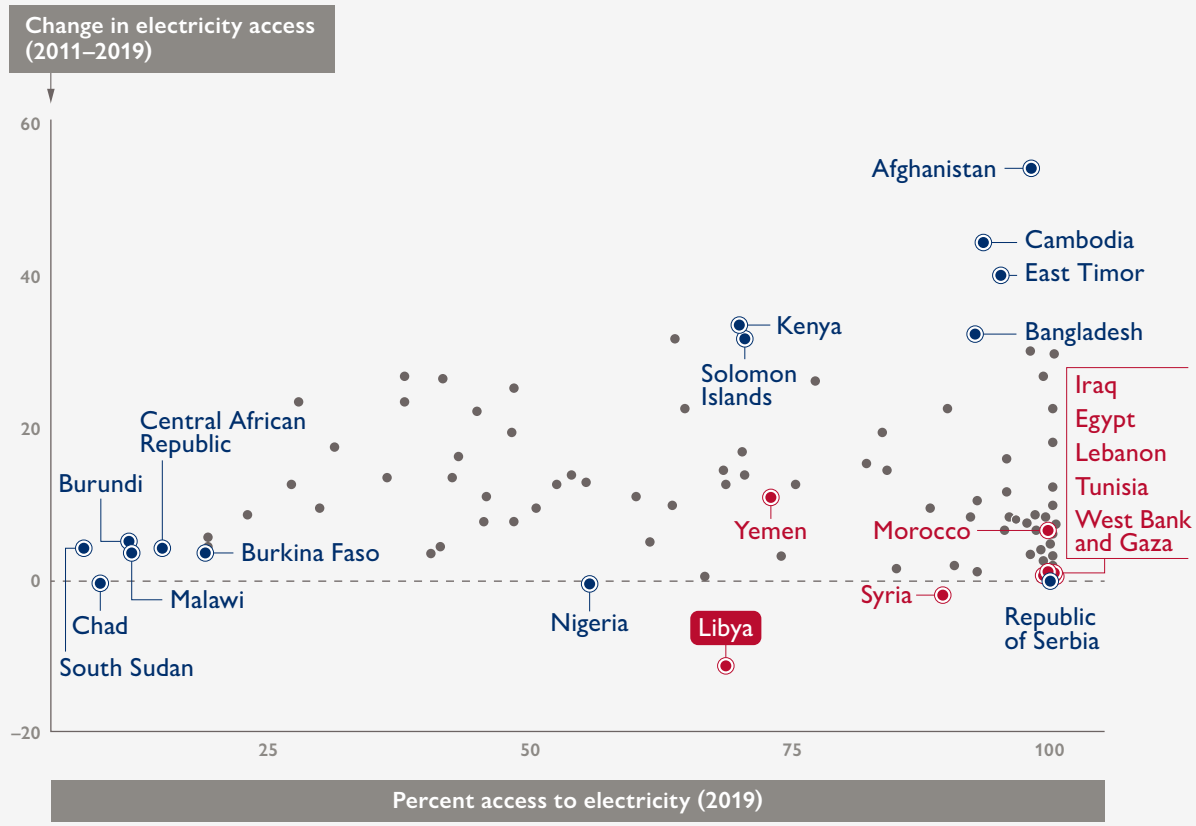
There are no international IXPs in Libya. If users of different ISPs want to exchange data, they have to leave the country, the region, and sometimes even the continent. If a Libyan internet user wants access to content hosted in-country (such as a government or university website), for example, this may require data to pass through the nearest IXP in southern Italy. This means higher costs, slower speeds, and poorer quality of service.

BOX 3: When you can't take electricity for granted

Barriers to digitalization go beyond available technology and skills in Libya, and are largely affected by the environment. Apart from outdated regulations and damages to infrastructure, interviewees cite frequent electricity outages among the biggest barriers to increased connectivity. As one interviewee cites, "without electricity, there is no digital transformation."[10]

GECOL owns and operates the country's electricity lines and has a relatively smart grid.[11] Libya's electrical grid was well maintained until the 2014 conflict. Since then, there has been severe deterioration, and the grid has not had regular software updates in the last five to six years. Power stations and generating facilities have been destroyed or cut off, and planned improvements were not made.[12] Lack of physical security allowed gangs to steal copper wires from power stations.

According to World Bank data, access to electricity in Libya has steadily declined since 2000. In 2019, only about 69 percent of Libyans had access to electricity. Even among those who have access, load-shedding and blackouts are a regular occurrence. Electricity outages can be attributed to a number of reasons: poor maintenance, damaged or destroyed transmission lines, theft of equipment, and stalled projects. All of these issues essentially stem from one root cause—a decade of instability.



10 International development project, Interview by the DECA team, April 2021, online.

11 The digital technology that allows for two-way communication between the utility and its customers, and the sensing along the transmission lines is what makes the grid smart. Like the internet, the Smart Grid will consist of controls, computers, automation, and new technologies and equipment working together. In this case, these technologies will work with the electrical grid to respond digitally to quickly changing electric demand.

12 International development project, Interview by the DECA team, April 2021, online.

The plot above compares countries according to their level of electricity access in 2019 (horizontal) and their change in electrification between 2011 and 2019 (vertical). The horizontal line is at zero, indicating no increase between 2011 and 2019. Most countries lie above this line, meaning that electricity access increased (sometimes dramatically). The two striking examples of de-electrification over this time period are Libya and Syria. Libya has the lowest rate of electricity access in the Middle East region, and has shown greater loss of access to electricity than any other country in the world.

Digitalization is a path toward greater efficiency, transparency, and a connection to the rest of the world, but it cannot be fully achieved until electricity improvements are made. In June 2021, the GNU declared electricity maintenance and upgrades a top priority of the interim government.

MOBILE BROADBAND: OPPORTUNITIES AND TRIALS

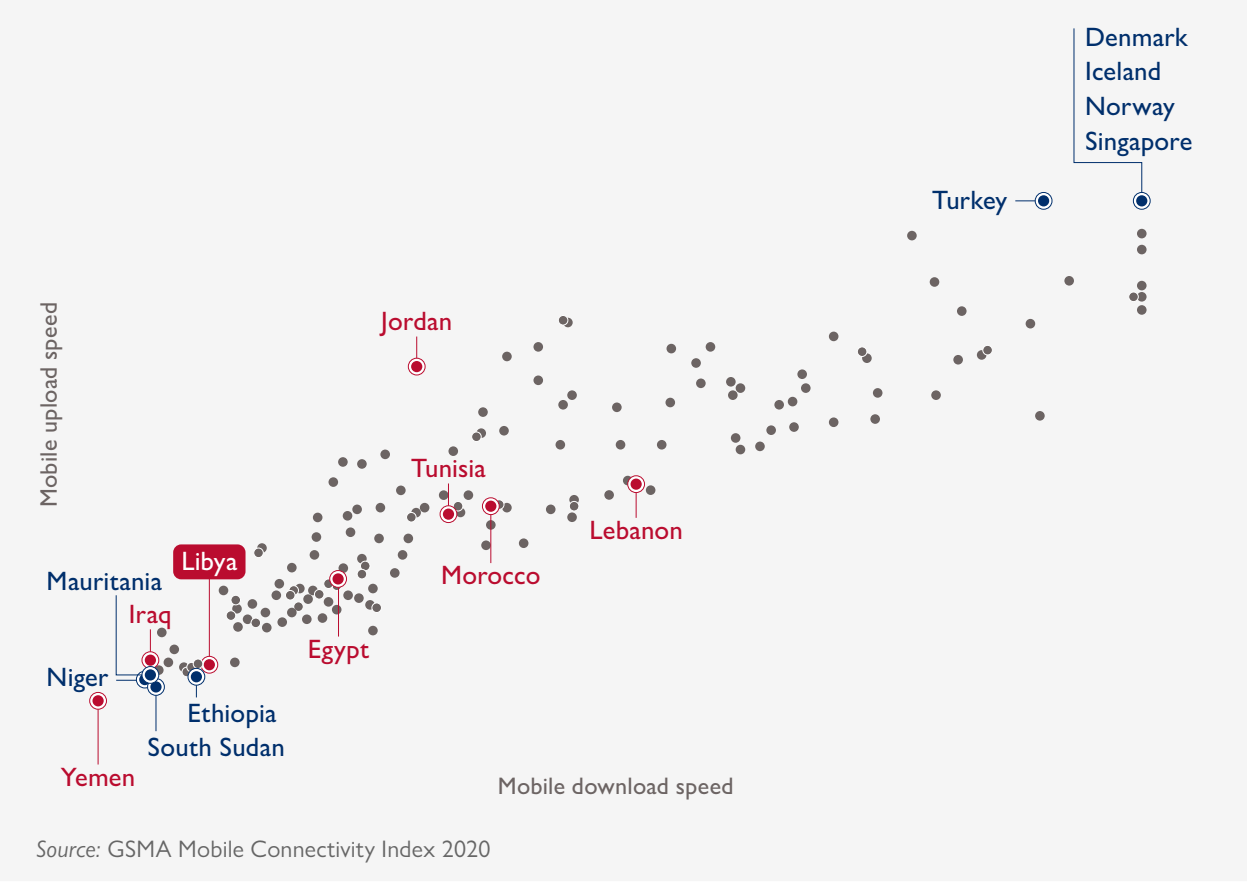
Mobile broadband is widely and heavily used by Libyans owing to poor fixed broadband infrastructure and the popularity of mobile-friendly applications like Facebook and Instagram.[13] Libya has two major MNOs: Libyana and Al Madar.

Libyana launched the country's first 4G mobile services in 2017 in Tripoli, Benghazi, and major cities in the East. Al Madar has followed suit and also provides 4G services to major towns and cities. GSMA has published network coverage maps based on self-reporting from MNOs (Figure 6) showing that Al Madar is the primary provider of high speed long-term evolution (LTE) services, although only in Tripoli and Benghazi (left image, dark orange). It also reports greater 2G coverage (pink) compared to Libyana (right image). According to LPTIC, the two MNOs together provide 4G coverage for 25–30 percent of Libya's population. LPTIC interviewees mentioned plans to expand to near 50 percent in 2021.[14] Interviewees suggest that Libya's traffic, or consumption of data, is currently "far behind" regional averages. Improvements in mobile broadband connectivity in recent years have helped to fill this gap. At the same time, network quality is a challenge. Figure 5 below shows that Libya lags behind most of its regional neighbors in terms of mobile connection speed.

13 This has been cited in several interviews—mobile devices/tablets often feel more approachable and easier to use than computers or laptops for those who are less digitally skilled. According to Datareportal, the share of web traffic by device is as follows: mobile phones (80.7 percent), laptops and desktops (17.6 percent), tablets (1.6 percent), other devices (0.09 percent).

14 Government agency, Interview by the DECA team, April 2021, online.

FIGURE 5: Mobile upload speeds versus mobile download speeds



Source: GSMA Mobile Connectivity Index 2020

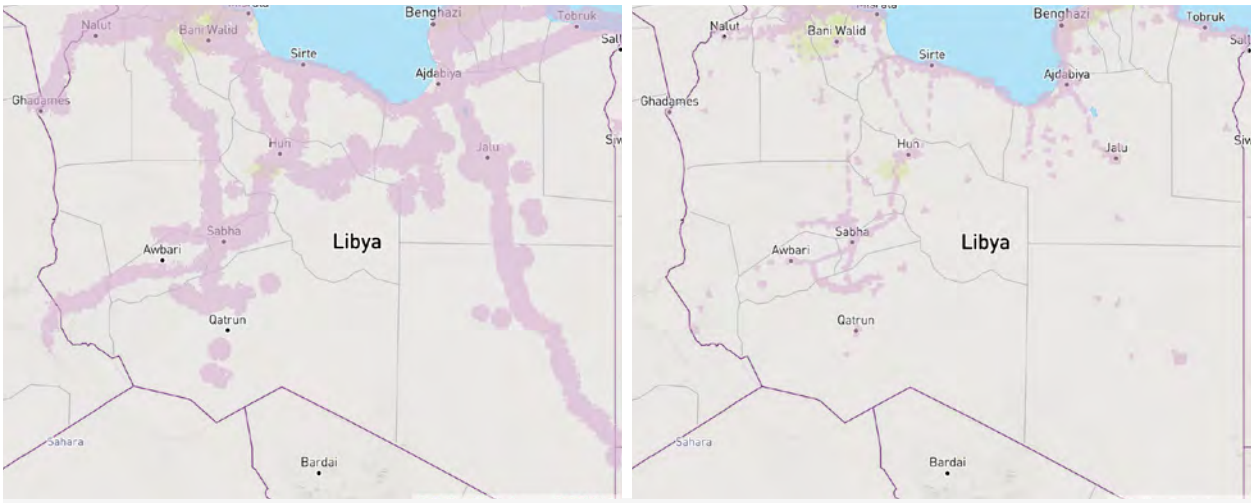
Some areas are not profitable due to the high cost of delivery compared to the revenue they would earn.[15] It is difficult for MNOs to expand their coverage into remote areas of southern Libya because of poor fiber backbone expansion. While 4G and fiber connectivity are mostly present in Sabha (the major city in the south), other surrounding cities such as Qatrun (about 140 miles south of Sabha) only obtained access to 4G in the summer of 2021. One interviewee described needing to "fight" for network expansion.[16]

According to LPTIC, Libyana's plans for the next year are focused on expanding and improving its 4G network coverage. The arrival of 5G seems imminent in Libya. In October 2019, Al Madar launched its first 5G pilot in Tripoli which was reportedly successful. Although national news indicated that this was the launch of 5G services, interviewees confirmed that it was a test run. LPTIC reportedly planned to deploy 5G in January 2022. Whether 5G is currently necessary in Libya is a topic of debate among experts.

15 Private sector organization, Interview by the DECA team, March 2021, online; CSO, Interview by the DECA team, April 2021, online.

16 CSO, Interview by the DECA team, June 2021, online.

FIGURE 6: Geographic network coverage maps: Al Madar (left) and Libyana (right)



Source: GSMA Mobile Connectivity Index 2020

BOX 4: When does data become "affordable"?

Mobile broadband affordability is critical in Libya, where consumers rely primarily on their phones to connect to the internet. The Alliance for Affordable Internet (A4AI) has set an affordability target threshold where 1 GB of mobile broadband data is priced at 2 percent or less of average monthly income or Gross National Income (GNI).

Libya reached A4AI's "1 for 2" measure for affordable internet in 2020, providing 1GB of data at 1.76 percent of the GNI (down from 2.16 percent in 2019). According to LPTIC, international donors attribute the huge improvement in affordability to subsidies. However, LPTIC maintains that cost reductions are due to minimized profit margins. An increase in the number of subscribers also increases revenue, allowing operators to drive down costs. Al Madar, for example, went from serving some 1 million subscribers in 2017 to serving 5 million subscribers in 2020, allowing 1GB of data to go from 7 Libyan Dinars (LYD) ($1.50) to 1–2 LYD ($0.22–$0.44).[17]

These national averages may mask geographic disparities. Even if prices are uniform across the country, broadband is less affordable in areas where household income is lower.

IMPLICATIONS OF 5G: KEY ENABLER OR OVERKILL?

5G is among the latest terrestrial mobile broadband technologies, and brings faster speeds, higher capacity, and better quality of overall services. However, opinions differ as to whether it is needed at this stage of Libya's digital development.

The argument *for* deploying 5G across Libya is that it skips a step and "leapfrogs" into enhanced digital technology. Libyans—especially those living in urban areas—frequently stream video and download movies due to the lack of relevant content available on television.[18] In densely populated urban areas this intensive use can create a huge strain on networks, resulting in poor quality. 5G networks could alleviate some of this network pressure. LPTIC, which is among the more tech savvy state-owned enterprises, believes that keeping up with cutting-edge technologies (such as 5G) is the best way forward for Libya, because it opens the possibility of parity with

17 CSO, Interview by the DECA team, June 2020, online.

18 IT Consultant, Interview by the DECA team, May 2021, online.

the rest of the world. LPTIC also argues that 5G will enable key government institutions to improve their efficiency and productivity.

The arguments *against* 5G also hold ground. Considering the high costs of deployment and more immediate needs in Libya, the deployment of 5G may not be necessary at present, nor the right thing to do. Some experts believe that 4G has not been utilized to its fullest capacity, perhaps not even in bigger cities. Most consumer needs can be met by maintaining and expanding 4G networks for the time being. Telecoms regulator GACI believes in waiting to deploy 5G until 4G penetration is exhausted.[19] This sentiment was shared by other expert interviewees.[20]

Not all 5G networks are the same. 5G can be divided into two major evolution steps: standalone (SA) vs non-standalone (NSA). Not much can be achieved in Libya without a stable regulatory environment, and more advanced projects (which would leverage SA networks) may not be feasible in the short term. Libya has a relatively strong 4G network in urban areas, so NSA 5G could be deployed in those areas to relieve some pressure. This is the pattern being followed in most countries, where 5G networks are deployed over the same spectrum bands used for 4G. Operators could build out SA 5G over a longer time period and deploy it in coming years. These decisions will ultimately be made by government entities— particularly LPTIC and GACI.

KEY TERMS | BOX 3: Standalone and Non-Standalone

To fully understand how 5G can reach middle ground in Libya, it is important to understand the basics of 5G architecture.

Non-Stand Alone (NSA) 5G refers to 5G services built over an existing 4G core network. Standalone (SA) is independent and connects directly to a 5G core network without any interaction with an existing 4G core.

The choice between NSA and SA can be made by understanding what each would help the MNOs achieve. If the primary goal is to provide high-speed connectivity to consumers with 5G-enabled devices, an NSA architecture is easier and more cost-effective. If the goal is to establish smart cities and advanced automation, SA architecture makes the most of unique 5G capabilities. The path forward will likely be negotiated between GACI and LPTIC. GACI's approach to 5G has been more cautious and incremental; given the October 2021 leadership changes at LPTIC it is not clear which direction they will take.

2.1.2. ADOPTION AND USE OF DIGITAL TOOLS AND SERVICES

Increased use of the internet among Libyans allows them to go beyond the confines of a city or town for social interactions.[21] In a country where conflict is fueled by a variety of tensions, digital connectivity has the potential to widen perspectives and unite people (see Box 9) or to fuel mistrust (see Section 2.2.3).

Libyans' adoption of digital tools and services is largely centered around their use of social media. Some 87 percent of Libyans are on social media; most are avid Facebook users. Facebook goes beyond just social interactions in Libya. It is a primary source of news, the main stage for e-commerce, and a way for local

19 Three government agencies, Interviews by the DECA team, April 2021, online.

20 IT Consultant, Interview by the DECA team, May 2021, online; International development project, Interview by the DECA team, April 2021, online.

21 IT Consultant, Interview by the DECA team, May 2021, online; International development project, Interview by the DECA team, April 2021, online.

governments, national government and government institutions (including CBL, NOC and HNEC), and CSOs to interact with the general public (more on these in Sections 2.2 and 2.3.3). Facebook is used for daily needs such as a Safe Paths group to share information about security threats, traffic conditions, and dangerous roads and areas in Tripoli.[22] Beyond the geographic boundaries of Libya, social media allows the average Libyan to connect with the outside world and expand awareness about global trends and issues.[23]

Undocumented migrants face exclusion from Libya's digital ecosystem. According to an interviewee working with a Libyan MNO,[24] persons who enter the country without proper documentation are unable to obtain a SIM card, essentially shutting them out of the digital ecosystem. Data from the International Organization for Migration and the EU Migration Policy Centre suggest that Libya is a destination and transit country for migrants from elsewhere in North Africa as well as from the Sahel and South Asia. It is unclear what fraction of Libya's current migrant population is undocumented.

The gender digital divide is significant in Libya. Women comprise only about 39 percent of Facebook's total Libyan audience. As one interviewee notes, family members of patriarchal societies in certain areas of Libya often attempt to protect women and girls by barring them from the digital space.[25] Women and girls in these areas may avoid using digital technology because they fear online harassment and abuse or because it is prohibited by their families or their culture.

STRENGTHENING THE FOUNDATION THROUGH TRUST AND RELEVANT INFRASTRUCTURE

Several factors inhibit the adoption of digital technologies, including institutional incentives, lack of trust, and resistance to learning new skills.

An interviewee at the Ministry of Education[26] highlighted the innovative approaches to online schooling during the COVID-19 pandemic, including videoconferenced classes (using Zoom, Microsoft Teams, or Google Classroom), television broadcasts including student participants, and social media engagement using Facebook, YouTube, and Telegram. While many teachers were skilled and proactive in technology adoption, this seemed less true of inspectors—experienced teaching staff assigned to evaluate and advise classroom teachers. When teachers face supervisors who are unenthusiastic about digital tools, they may feel that their careers will benefit more from relying on traditional approaches.

Experiences in the digital economy illustrate the critical role of trust. Libyans often use websites to browse products online, but many do not trust that delivery will happen properly or on time and prefer to shop in brick-and-mortar stores.[27] Although digital payments are slowly making their way throughout Libya, the recent history of inflation, parallel currencies, and corruption make cash feel more trustworthy.[28] Even if most experiences are positive, fraud or identity theft can dampen a victim's enthusiasm for digital financial tools. Sections 2.3.1 and 2.3.2 discuss regulatory gaps in Libya's digital economy and the ways in which mistrust is exacerbated by a lack of adequate consumer protections.

22 Think tank, Interview by the DECA team, April 2021, online.

23 CSO, Interview by the DECA team, April 2021, online.

24 CSO, Interview by the DECA team, April 2021, online.

25 Think tank, Interview by the DECA team, April 2021, online.

26 Government agency, Interview by the DECA team, April 2021, online.

27 International development organization, Interview by the DECA team, April 2021, online.

28 International development organization, Interview by the DECA team, April 2021, online.

Libya's culture thrives on face-to-face communication and shared backgrounds. Many digital service providers or projects have found that customer service and call centers allow for greater digital adoption because customers feel supported and more at ease.[29] Digitalization is about more than technology; it requires a bridge to a new way of doing things.

BOX 5: COVID-19 spurring digital health solutions: Speetar's experience

Speetar is a privately run Libyan telehealth platform that launched in 2018. With the onset of the COVID-19 pandemic, Speetar redirected its efforts to facilitate improved access to health care for Libyans through a private-public partnership. Speetar aims to create systemic change in Libya's health industry by enabling access to health care for those living in underserved rural or conflict-affected areas.

Doctors are among the first to leave Libya due to transferable skills and high demand. Speetar's original purpose was to enable doctors in the diaspora to treat patients back home via telemedicine. It has since expanded its scope to triage cases in Libya's fight against COVID-19. The global pandemic created an opportunity for Speetar to have an audience with the Ministry of Health and the Libyan National Centre for Disease Control. The team built an early COVID-19 specific platform within 40 days and received the necessary approvals to host their app on Google Play and Apple Store. Within the first 10 days, they had 70,000 users with a utilization rate that increased by 650 percent over the following 12 months. The platform continued to evolve over the subsequent six months to include enhanced analytics and reporting capabilities.

Previously, Libyans could call a number (195) that was poorly staffed. Telecenter representatives were not well trained on COVID-19. Information was recorded on paper, and data was often inaccurate and inconsistent. Speetar's COVD-19 app was initially based on U.S. Center for Disease Control guidelines and adapted for Libya. The app is a digital triaging system. Rather than having customer representatives answer every phone call, patients can log on and register their symptoms, allowing clinicians to more efficiently determine which patients need their immediate attention and which can be safely monitored at home.

The United Nations Development Programme (UNDP) supported Speetar, ensuring that the platform adhered to all laws and regulations. This was especially important given the lack of regulatory clarity, which could lead to misuse of sensitive health data. When Speetar started, government officials were not sure whether to classify them as a telecom company or as a hospital (they were neither). Early government buy-in enabled the app to register as a technology development company—with a focus on healthcare data management and telecommunications—within a reasonable time frame. Unfortunately, not all new app developers are likely to have the relationships, sector expertise, and fortuitous timing that helped Speetar get off the ground.

COVID-19 POSITIVE EXTERNALITIES: A GLIMPSE INTO DISTANCE LEARNING

As in many countries, Libya's digital adaptation to COVID-19 included experiments with distance learning. While the Libyan Ministry of Education (MOE) had previously used television broadcasts to reach children who cannot attend school, the pandemic led to a dramatic expansion of educational broadcasts. Classes were repeated two to three times per day, allowing children with multiple siblings and only one television set to keep up with their lessons. In June 2020, the MOE established its own Education Libya Channel.

In 2021, the MOE added a new strategy of providing virtual lessons via Zoom or Google Classroom, and broadcasting the recordings (including student participants) on television. They adopted a hybrid system for some schools where children attend in person for three days and virtually for three days. Success was not

29 Private sector, Interview by the DECA team, April 2021, online.

universal. Parents and teachers varied in their comfort with online schooling, and electricity outages and lack of access to devices hindered many children from virtual learning. Of the 5,000 public schools in Libya, only about 100 successfully adopted a hybrid strategy.[30]

2.1.3. DIGITAL LITERACY IN LIBYA

Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social, and political life. Digital literacy involves a variety of skills, summarized in the EU's DigComp 2.0 framework (see Table 2). USAID's Digital Strategy emphasizes the importance of digital literacy in extending the benefits of digital transformation to everyone, including the vulnerable and marginalized.

TABLE 2: EU DigComp competence areas and competences

COMPETENCE AREA	COMPETENCES
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content 1.2 Evaulating data, information and digital content 1.3 Managing data, information and digital content
2. Communication and collaboration	2.1 Interacting through digital technologies 2.2 Sharing through digital technologies 2.3 Engaging in citizenshop through digital technologies 2.4 Collaborating through digital technologies 2.5 Netiquette 2.6 Managing digital identity
3. Digital content creation	3.1 Developing digital content 3.2 Integrating and re-elaborating digital content 3.3 Copyright and licenses 3.4 Programming
4. Safety	4.1 Protecting devices 4.2 Protecting personal data and privacy 4.3 Protecting health and well-being 4.4 Protecting the environment
5. Problem solving	5.1 Solving technical problems 5.2 Identifying needs and technological responses 5.3 Creatively using digital technologies 5.4 Identifying digital competence gaps

Source: The Digital Competence Framework, European Commission

1. Information and Data Literacy

Some 81 percent of Libyans have a Facebook account,[31] and it is the dominant platform in the country for communication, e-commerce, and social engagement. A ranking of the most popular websites in Libya also includes search engines (Google and Yahoo), an online encyclopedia (Wikipedia), and several e-commerce sites (OpenSooq, AliExpress, and Amazon). The clearest difference between the top sites for Libya and the U.S. was the relative

30 Government agency, Interview by the DECA team, April 2021, online.

31 This is based on the assumption that there are 5.5 million Facebook users in a population of about 6.8 million. 5.5 million may not represent unique individuals - that is, one person may own multiple accounts.

unpopularity of non-Facebook social media platforms (e.g., Instagram, Twitter) in Libya. Media literacy is an aspect of digital literacy, and many Libyans have expressed concerns about the prevalence of online mis-, dis-, and malinformation (see Section 2.2.3).

2. Communication and Collaboration

Data from Facebook's advertising tools provides insight into how Libyans use social media to communicate and collaborate. Compared to social media users in the U.S. and the UK, Libyans are more inclined to like and comment on Facebook posts, and to like a larger number of pages. These numbers are even higher for Libyan women, whose social media use is more interactive than that of their male counterparts. This area of competence also includes more advanced digital skills such as navigating e-government platforms and identity management. The lack of population surveys or data collection on this topic means that researchers could not find information about a population's proficiency in these areas.

3. Digital Content Creation

A global analysis of contributions to collaborative content platforms (such as Wikipedia, GitHub, and OpenStreetMap) suggests that MENA countries generally show a lower degree of collaborative participation than one would expect based on their level of internet penetration. Within North Africa, Libya lags behind Algeria, Tunisia, and Egypt in its participation level. Data for GitHub is particularly striking. GitHub is a platform for collaborative code development and publishing, and can be seen as a proxy for a country's level of involvement in generating technology, rather than merely consuming it. Tunisia is one of the most active countries in Africa (along with Ghana and South Africa), while Libya's per capita involvement is similar to those with the lowest participation in the region: Syria, Iraq, and Saudi Arabia. This pattern may change in the future, as a few Libyan non-governmental organizations (NGOs) have launched digital content creation skills programs (see Box 6).

4. Safety

While Libyan social media adoption levels are impressive, many interviewees expressed concerns about public awareness of online safety. One interviewee related that older people go to a cell phone shop to ask for help opening a Facebook account because they want to be able to read news.[32] The shops retain the customer's identification (ID) and password so they can help if the password is forgotten.[33] While this is a helpful service for customers, it is a questionable digital safety practice.

5. Problem Solving

A handful of Libyan organizations are beginning to establish digital literacy programs for skills building as demand increases, particularly from students and aspiring entrepreneurs (see Section 2.3.4). Some initiatives include curricula focused on children, to ensure that they grow up to be digitally literate and informed citizens (see Box 6).

32 CSO, Interview by the DECA team, March 2021, online.

33 Think tank, Interview by the DECA team, April 2021, online; CSO, Interview by the DECA team, March 2021, online.

BOX 6: Digital literacy initiative spotlight: SheCodes and Elham Education

Digital literacy is not built into public school curricula at present. However, over the past few years, several initiatives have evolved with the aim to increase digital literacy across Libya. Organizations like Elham Education and SheCodes focus on providing tailored training to children as well as to adults.

SheCodes is a Libyan NGO that started in 2018, aiming to teach coding skills to female teachers and working professionals. Because of restricted funding, SheCodes is largely project-based. Bootcamps are designed around the needs of their clients (typically international development organizations, including Expertise France). Beyond their focus on women, SheCodes has expanded its capabilities to teach children as well. The NGO provides a holistic experience. In addition to coding, students are taught about cyber hygiene and how to manage their financial reports. To account for electricity shortages, instructors prepare offline exercises to ensure that their students can continue learning when their power is out.

Elham Education offers technology-based training and education, both online and offline. Their target audience is ages 9 to 25. They offer a range of services, from three-day training programs in public schools (a social responsibility program called *Hemam*) to more established settings in private schools and training centers that provide equipment, online platforms, curriculum, and mentoring (Inspire Labs). Their recently created Inspitron offers courses (both online and offline) in five tech specializations: web development, app development, games development, electronics, and graphic design. Inspitron teaches these digital skills using gamification as a learning method.

While both of these projects cater to specific audiences—usually privileged urban families—their experiences could be leveraged to build out more inclusive digital literacy initiatives.

PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

Digital Society, Rights, and Governance focuses on how digital technology intersects with government, civil society, and the media. This pillar is divided into three sub-sections: Internet Freedom; Civil Society and Media; and Digital Government. Internet Freedom explores factors that enable or constrain the exercise of human rights and fundamental freedoms online. This includes individual rights to freedom of speech, privacy, and free assembly, and the abuse of these rights through digital repression. Civil Society and Media identifies key institutions and how they report on, advocate around, and influence online freedoms. Digital Government looks at the government's efforts to manage internal IT processes and systems, deliver citizen- and business-facing e-services, and engage with the public through digital channels.

KEY TAKEAWAYS: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE

- Libya's decade-long conflict and instability have limited the HoR's ability to clarify roles, and responsibilities, and to pass new legislation. Laws from the previous regime are still technically in force.
- Government digital initiatives are often siloed in separate Ministries. Recent events have shown greater openness to multistakeholder engagement, particularly around e-payments and promotion of Libya's ICT industry.
- The government is prioritizing digitalization; however, there are significant barriers to execution. These are tied to inadequate digital infrastructure, a piecemeal approach rather than an overall strategy, and insufficient legal and regulatory frameworks.
- Facebook dominates Libya's information and media landscape to a greater extent than in most countries. It is the primary news source for many Libyans and can allow for conversations between citizens and CSOs or municipal governments. However, the platform also creates risks such as widespread mis-, dis-, and malinformation and online harassment of activists, journalists, and marginalized groups.
- **Cross-cutting:** Libyan government institutions have uneven cybersecurity capabilities and there is no information publicly available on cybersecurity strategies, data privacy laws or authority, or effective cyber crisis management.
- **Cross-cutting:** CSOs and journalists have limited capacity to respond to cyber attacks and online harassment, often leading to self-censorship.

RELEVANT RECOMMENDATIONS

1. Counter online disinformation by partnering with Libyan change agents and engaging platform companies.
2. Promote reconciliation by leveraging citizen journalism and Libya's storytelling culture on social media platforms.
3. Bolster digital government initiatives through research, intergovernmental exchanges, donor coordination, and embedded technical advisors.
4. Ensure that HNEC's future plans for biometric voter registration account for human rights and privacy issues.
5. Support legal reforms to promote digital development and the protection of human rights online.
6. Promote coordination through a multistakeholder internet governance forum and a government-wide Office of Digital Initiatives.
7. [Cross-cutting] Strengthen cybersecurity capacity through civil society engagement and workforce development.
8. [Cross-cutting] Promote the Principles for Digital Development with donors, partners, and the government.

INTRODUCTION

Several dynamics have shaped the landscape for digital rights and governance in Libya. Civil conflict has bred political gridlock and prevented significant reforms. The conflict has taken on an online dimension, with armed groups (and their foreign backers) leveraging the internet for both propaganda and tactical advantage. The legacy of the previous regime persists. Ambiguous pre-2011 laws remain in force and are unevenly applied and enforced.

Efforts have been made to address legal and regulatory gaps. Government ministries have drafted text for new legislation, with the hope that it will be passed once the HoR is able to focus on digital reforms. The 2021 cybercrime bill is a potentially significant legal development, although it has drawn criticism and has not yet been signed into law.

2.2.1. RULES AND ROLES IN DIGITAL GOVERNANCE

TABLE 3: Digitally aligned government bodies

ENTITY	DIGITAL ROLE
Ministry of Communications and Informatics (CIM)	Established after the 2011 revolution by the transitional government to oversee the telecommunications sector. Officially, the Ministry runs the sector through two main bodies: LPTIC and GACI. The Ministry has not been officially active since 2013 and LPTIC and GACI operate individually.
General Authority of Communications and Informatics (GACI)	The ICT regulator, formerly known as the General Telecom Authority (GTA). GACI is nominally responsible for policymaking and regulations.
Libyan Post Telecommunications & Information Technology Company (LPTIC)	State-owned holding company that owns all major telecommunications providers including Libyana, Al Madar, LTT, and Hatif Libya.
National Information Security and Safety Authority (NISSA)	Promotes and supports the safe use of ICT resources. Prevents, detects, and responds to cyber risks. Houses the Libya Computer Emergency Response Team (Libya-CERT).
General Information Authority (GIA)	Independent body responsible for implementing state policies in the information field. Maintains the database that underpins Libya's ID system.[34]

UNCERTAIN LEGAL ENVIRONMENT

The current foundational legal document in Libya is the 2011 Constitutional Declaration which states that laws and regulations from the previous regime are still in force if not inconsistent with the Constitutional Declaration. This leaves a gray area of interpretation, which has yet to be resolved. In 2014, Libya held a Constitutional Assembly election to select the drafters of a new constitution. A 2017 draft was never put forward for adoption.[35]

Freedom of opinion, communication, and the press are guaranteed in the 2011 Constitutional Declaration. Articles 12 and 13 guarantee the right to a private life for citizens and the confidentiality of correspondence, telephonic conversations, and other forms of communications. Exceptions may be authorized by judicial warrant. There is no specific personal data protection legislation, nor is there an independent public supervisory authority responsible for personal data protection.

Stakeholders provided different responses about laws and regulations prohibiting cross-border data flows or data localization. The CBL states that banks may not keep customer data outside of Libya. At the same time, the CBL has asked local technology experts about the safety of storing data using cloud services, which could

34 Government agency, Questions and responses exchanged by email with the DECA team, May 2021, online.

35 At UNSMIL's recommendation, Libya's governing body at the time decided to postpone a constitutional referendum until after general elections are held. This decision is still contested by some groups and may be an impediment to a successful presidential election. (See Konrad Adenauer Stiftung, "Inside Libya #11", pg. 8–9).

open the door to cross-border transfers of personal data. A civil society group in Libya claimed that data related to the oil sector must be stored in Libya, while others commented that the law is silent with regard to data in general. This is a gap between Gaddafi-era laws and modern practices.

STEPS TOWARD MULTISTAKEHOLDERISM

Public-private dialogue on internet governance is limited in Libya, and a national Internet Governance Forum (IGF) initiative does not exist. National IGF initiatives are a component of the global IGF organized by the UN General Assembly, and allow countries to discuss and address internet governance issues in a context-specific manner. These are spaces for open and inclusive dialogue, venues to share best practices and experiences, platforms to identify emerging issues and bring them to the attention of the relevant bodies and the public, and a means to contribute to capacity development for internet governance. Although individual experts from Libya attended the 2020 UN global IGF conference, the Government of Libya did not send an official delegation.

BOX 7: Multistakeholder internet governance

A multistakeholder internet governance model is one in which governments, the private sector, and civil society collaborate to establish principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet.

One topic that benefits from a multistakeholder internet governance model is the governance of a Country Code Top-Level Domain (ccTLD). A domain name registry is the database that maps human-readable domain names (such as usaid.gov) to Internet Protocol (IP) addresses (such as 2001:559:19:f88a::1923). This can be a contentious task, as domain names often have significant commercial and political value. A multistakeholder domain name governance body can impartially decide which organizations can register domain names or adjudicate disputes over domain name ownership.

In Libya, LTT has been assigned as the regulator of the .ly ccTLD. LTT is a state-owned enterprise, and its processes, decisions, and actions are managed by the government. The .ly domain is often used by non-Libyan sites such as ow.ly and bit.ly to create a catchy and memorable domain name hack. Foreign sites using the .ly domain purchase a domain name from an LTT-approved registrar.

A consultative process allows for potential issues to be addressed before laws are enacted to ensure that the regulatory climate is predictable, respectful of international laws and obligations, and attractive to foreign investment. Interviewees from private sector companies said that they are not routinely consulted by the government on draft legislation or initiatives. Government interviewees, however, maintained that they often consult with external stakeholders and welcome these interactions.[36] It is unclear whether this disconnect results from a difference in opinion as to the ideal level of consultation, or from dissatisfaction with the outcomes of consultation.

A number of recent events suggest that the government is open to a more collaborative relationship with the private sector. In February 2021, LPTIC hosted a meeting to discuss future plans with the American Chamber of Commerce in Libya, representatives from the U.S. Embassy, and multiple American telecommunications and technology companies. The non-governmental group Libyan Organization for Information and Communications Technology (LOICT) brought together government and local private sector representatives to discuss a new

36 Government agency, Interview by the DECA team, April 2021, online; Government agency, Questions and responses exchanged by email with the DECA team, May 2021, online.

e-payments law in May 2021.[37] This organization also designated June 1 as Libya National Technology Day, which was recognized by the government as an official event receiving support from LPTIC and several other government entities. The level of government involvement surprised the organizers, who saw it as a sign that the government is open to increased stakeholder engagement. One interviewee praised the changing mindset of leaders and their willingness to hear new ideas and engage.

INSTITUTIONALIZING CYBERSECURITY

In 2013, the Libyan government established a computer emergency readiness team (Libya-CERT) under the umbrella of the NISSA. NISSA is responsible for promoting and supporting the safe use of ICT resources and also develops and implements mechanisms for cyber incident detection and response.

Out of 160 countries in the National Cybersecurity Index, Libya ranks quite low at 142. This is significantly lower than Libya's rankings on most digital development indices, and suggests that cybersecurity capabilities have not kept pace with the growth of the digital ecosystem. There is no information publicly available on cybersecurity strategies or cyber crisis management. Evidence suggests that there has been little progress in alignment with international cybersecurity standards, despite Libya's membership in ITU-IMPACT, AfricaCERT, and OIC-CERT. While Libya is regularly represented in regional cybersecurity forums, it is not a member of the Forum of Incident and Response Security Teams (FIRST), there is neither a national cyber crisis management plan, crisis exercises, nor volunteer responders, and it has not ratified the Convention on Cybercrime. The News and Activities sections of the NISSA website have not been updated[38] since April 2020, and focus primarily on intragovernmental meetings and participation in cybersecurity workshops hosted by other countries in the region.

Stakeholders believe that the barriers are more political than technical. The government has received international training and support (especially from Gulf states with better-established CERTs) yet the sentiment is that there have been no tangible improvements.[39] NISSA is perceived as being dominated by the Ministry, with a bureaucratic relationship in which a lot of energy is consumed in preserving its budget.[40]

Multiple government agencies have reportedly experienced cyber breaches.[41] After-action reports on these incidents are viewed by interviewees elsewhere in the sector as lacking in quality analysis or recommendations.[42] Weaknesses in cyber hygiene may also contribute to the problem. Interviewees complained that government staff use Gmail addresses for official business and lack care in protecting data.[43]

Several interviewees, including country experts and public sector officials, attributed Libya's lack of progress in cybersecurity to the perception that cybersecurity isn't a direct threat[44] felt by most people, and to political, not technical, challenges.[45] Continued inattention and more serious cyber breaches could threaten Libya's

37 CSO, Interview by the DECA team, June 2020, online.

38 Last accessed: September 7, 2021. Note that the English language version of the site contains several articles that were posted in Arabic throughout 2017–2019 and were all translated and reposted in English at the same time. The Arabic version of the site also appears to have no new updates since April 2020.

39 IT Consultant, Interview by the DECA team, May 2021, online.

40 ibid.

41 IT Consultant,Interview by the DECA team, May 2021, online.

42 ibid.

43 CSO, Interview by the DECA team, April 2021, online.

44 IT Consultant, Interview by the DECA team, May 2021, online.

45 ibid.; Others like an international development project have also said overall cybersecurity is very poor.

economic development and jeopardize the reputation of all digital approaches. Rebuilding trust after an incident will require significant effort.[46]

KEY TERMS | BOX 4: Cyber Hygiene

Cyber hygiene is a key digital literacy skill required to secure data and personally identifiable information on systems and digital devices. Poor cyber hygiene is often the root cause of system vulnerabilities and cyberattacks. Common cyber hygiene practices include: regularly changing passwords, using two-factor authentication, using and updating licensed software, backing up data, and limiting access to systems and platforms.

Source: USAID Digital Literacy Primer

2.2.2. THE POTENTIAL FOR DIGITAL GOVERNMENT

Digital government[47] refers to the use of digital technologies as an integrated part of government modernization strategies to create public value.[48] Successfully navigating digital transformation requires more than adopting new applications; it requires a shift in processes and attitude toward agile and collaborative decision-making.

Digital government is built around three core functions: deliver, manage, and engage. The performance of digital government services depends on foundational elements such as change management, human capacity, legislation, policy, regulation, and infrastructure. Investment in these core components and foundational elements can help government bodies become more coordinated, efficient, resilient, proactive, and accountable.

Government entities and state-owned enterprises in Libya have shown interest in digitalizing their processes. However, ongoing conflict and organizational silos within the government have slowed and often interrupted Libya's progress toward digital government.

DELIVERING GOVERNMENT SERVICES

The government's efforts to deliver services digitally can best be described as good intentions in a crippling environment. Many government stakeholders outlined detailed plans for digital initiatives that were placed on hold due to political instability.[49] They are eager to review those plans and implement them once conditions are more favorable.

Ambitious plans for digitalization

There are champions both inside and outside (see Box 10) government with ambitious plans to leverage digital tools and technology. One example is the 2013 E-Libya project, which aimed to provide better government services across Libya. The rationale behind this project was that Libya is a big country with a small, widely dispersed population. Bureaucracy and lack of automation means that many people have to travel long distances to get important documentation like passports and driving licenses. Digitalized services could mitigate this problem by making a wide array of services available online.

46 ibid.

47 USAID uses the term digital government; other sources use terms like e-government or e-services to describe the same functions.

48 Digital Ecosystem Framework | US Agency for International Development.

49 2 Government agencies, Interview by the DECA team, April 2021, online.

The Government of Libya worked in a multi-agency process with the ITU and World Bank to design this project. They identified requirements and technical issues for applications including passport control, civil registry, and land registry, and decided to pilot the project in 40 to 50 of Libya's 300 post offices. They were set up with connectivity and ready to be launched but plans were put on hold with the rise of conflict in 2014. In DECA interviews conducted in 2021, both LPTIC and GACI identified the resumption of this project as a priority in the coming years.

External stakeholders and GACI highlighted internal struggles within the national government as another barrier in the e-Libya strategy implementation. According to an interviewee who had worked on earlier initiatives (including one launched in 2008),[50] the previous approach was for government entities to create their own ICT systems which would be connected subsequently. In 2013, the strategy changed to focus on the creation of a single overarching digital government initiative that would establish shared IT infrastructure across the executive branch. Some interviewees felt that it might have been more feasible to start with smaller initiatives, given conditions at the time. According to public sector interviewees, the 2013 plan floundered due to internal disagreements, budgetary issues, and ongoing conflict.

In contrast to the national government, interviewees reported that municipal governments have successfully piloted digital technologies at the community level, since they are closer to citizens and their needs[51]. Examples from interviews include partnerships around health care and public transportation.

One interviewee commented that it is not the technology that is holding the national government back but rather a complex set of factors including conflict, political will, bureaucratic culture, and staff capacity.[52] Digital government is not functioning properly at present.[53] Citizens must still routinely visit offices in person, despite the availability of government websites and online information.

Discussions around digital identification

Libya created a national ID system in 2013 and World Bank data indicate that 53 percent of Libyans have an official ID—among the lowest levels in upper-middle-income countries. Unlike many high-functioning digital ID systems, Libya's ID cannot be used across government bodies in an integrated manner. Although the government claims to have a fully functioning website and app for requesting an ID, DECA researchers were unable to successfully obtain access to the site or to the app. In 2015, the government maintained a functional online passport service that also processed applications for a national ID. However, the system did not have effective safeguards in place, and people who may not have been eligible to receive IDs and passports were still able to obtain those legal documents.

50 IT Consultant, Interview by the DECA team, May 2021, online.

51 3 CSOs, Interview by the DECA team, April 2021, online.

52 Think tank, Interview by the DECA team, online; IT Consultant, Interview by the DECA team, May 2021, online.

53 IT Consultant, Interview by the DECA team, May 2021, online; Private sector organization, Interview by the DECA team, March 2021, online.

BOX 8: Digital ID systems: To link or not to link?

In many countries around the world, discussions of digital identification systems can be politically and emotionally charged. Themes of national identity, ethnicity, religion, privacy, and state sovereignty often surface in discussions of ID, alongside more technical discussions of cost, efficiency, sustainability, and cybersecurity.

Broad integration of ID systems can support more seamless citizen-facing government services. Those who favor system integration (such as the World Bank) portray digital ID systems as an empowering force that broadens inclusion and opens up freedom to transact, travel, and exercise modern citizenship. On the other hand, many civil society organizations (such as Access Now) are concerned that ubiquitous, universally connected ID systems can become tools of surveillance, repression, and social control.

This debate highlights the need for new technologies accompanied by appropriate legal protections, regulatory enforcement capacity, and respect for human rights. Rushing to implement digital ID systems (or any new technology) without safeguards and digital rights protections is imprudent.

For more on digital ID, see here for public resources from USAID.

The Libyan government plans to utilize digital tools in the presidential elections (originally scheduled for December 2021[54]). HNEC's goal is to support a high-turnout election with fast and accurate results and to thwart attempts to sabotage the election. To that end, they allow voter registration via short message service (SMS), and use the Civil Registry database to automatically confirm voter information. Voter identity will also be confirmed at polling sites using paper cards with a quick response (QR) code. HNEC aims to counter attempts to undermine the election through a network of media centers that will monitor social media pages and traditional media to debunk rumors and disinformation.

HNEC's future plans involve extensive technology adoption. They intend to replace paper IDs with a biometric smart card system that will interface with an electronic voting system at polls.[55] At the moment, HNEC's access to the civil registry is read-only—they use it only to confirm identity details provided by prospective voters. A more fully integrated system would allow Libyans to use their national ID as a voter ID (rather than having a separate voter card). An integrated ID system could also allow for biometric identity verification in public transportation, health care, and digital payments. More extensive integration of ID systems also raises the potential for cybersecurity threats. Digital ID systems elsewhere have suffered from high profile security failures.

COVID-19: A driver of government digitalization

The COVID-19 pandemic has been another impetus for digital government services. Section 2.1.2, Box 5 describes how Speetar created a workable app that helped to evaluate the seriousness of COVID-19 cases (and helped to determine whether users should stay home or visit a hospital) in a timely manner.

The Libyan Customs Authority took temporary measures to allow electronic document submission during the pandemic (see Section 2.3.4). Formalization of these procedures requires legislative changes. These examples demonstrate that digitalization of government processes is possible when there is political will.

Media monitors noted that the pandemic overtook all other considerations and dominated online discourse for several months. Some actors hoped to leverage the COVID-19 crisis as a way to bring warring factions

54 As of August 2022, no date has been set for a new presidential election.

55 Government agency, Interview by the DECA team, April 2021, online.

together and end the conflict.[56] Instead, the onset of the pandemic coincided with an escalation of fighting. Some commentators attributed this to international powers being "distracted" from their obligations in Libya, providing an opening for local militias and their foreign sponsors to step up the conflict. August 2020 protests coincided with the first wave of COVID-19 cases in Libya and intensifying economic fallout from the global pandemic. Those protests ultimately contributed to the October 2020 peace agreement.

MANAGING SYSTEMS AND PROCESSES

The complex governance challenges Libya has faced over the last decade feature prominently in its approach to digital systems and processes. Interviewees pointed out challenges with many of the foundational elements of digital governance, particularly infrastructure, change management, and human capacity. These elements are necessary for effective service delivery or public engagement, but the management of back-end systems is where the challenges are most apparent.

Government data infrastructure

Government data are currently siloed[57] with multiple physical data centers[58] and there are no digital exchanges between ministries.[59] Each duplicate data center requires significant investment and frequent updates. As a response, LPTIC launched the Al Madar cloud hosting services, with the CBL as their first client. The eventual goal is for all government agencies to host their services on the Al Madar cloud.[60] Data sharing will likely be a major point of friction. Merging data for greater efficiency will require more than just a technical fix. It will require a culture change that could threaten the prerogatives of current government officials.[61]

Change management and resistance to digitalization

Digitalization of government services can increase transparency, and automation of the citizen-state interface can decrease opportunities for favoritism and bribery. Those who currently benefit from outdated and opaque systems may be resistant to change.

One civil society interviewee asserted that digitalization would lead to a huge unemployment dilemma. The government is Libya's largest employer, with estimates that over 80 percent of Libyans have a public sector contract. If government digitalization improves efficiency by eliminating public sector jobs, this could create backlash.[62]

Human capacity and digital government

Rather than rely on foreign platforms such as Facebook, digital government service delivery platforms in most countries use custom-built apps and web portals that provide more advanced features like fillable forms, online payments, and ID authentication. Interviewees expressed the belief that Libyans prefer to call a telephone line rather than fill in an online application or form.[63]

56 USG, Interview by the DECA team, March 2021, online.

57 Private sector organization, Interview by the DECA team, April 2021, online.

58 IT Consultant, Interview by the DECA team, May 2021, online.

59 Government agency, Questions and responses exchanged by email with the DECA team, May 2021, online.

60 Government agency, Interview by the DECA team, April 2021, online.

61 Note that the private sector has also taken steps to launch data centers. The Trans-Saharan Telecommunications Company signed an agreement to establish Tier 3 data centers. A Tier 3 data center is a location with redundant and dual-powered servers, storage, cooling systems, network links and other IT components.

62 CSO, Interview by the DECA team, April 2021, online.

63 CSO, Interview by the DECA team, March 2021, online; International development organization, Interview by the DECA team, April 2021, online.

Personnel factors will also affect the government's pace of digital transformation. The shortage of people with IT skills in Libya's economy makes it difficult for the government to attract and retain talented digital workers.[64] Younger, more digitally literate staff often leave government jobs for higher salaries in the private sector. As a result, the public sector relies on international experts who frequently do not transfer skills or build capacity.[65]

Engaging the public

A bright spot in the digital landscape has been the use of digital tools as convening spaces to support the democratic transition. USAID and United States government (USG) projects have multiple examples of this, including supporting Libyan high school debate teams in collaborating with the Central Commission of Municipal Council Elections (CCMCE) and other relevant stakeholders to hold virtual municipal council debates. Libyan CSOs have also partnered with CCMCE to help them fact check information online.

Libya's youth population is technically proficient with social media platforms. At the same time, youth are often hesitant to engage politically because they feel excluded by older male decision-makers, are apathetic, or believe that speaking out and drawing attention will put them at risk. A few stakeholders are hopeful about increasing youth political engagement and cited the inclusion of youth in the Libyan Political Dialogue Forum process.[66]

Among the most notable examples for civic engagement online are *Multaqa Watani* (Arabic for "national forum")[67] and *al-Hiwar*[68] (Arabic for "dialogue") supported by the United Nations Support Mission in Libya (UNSMIL). These interactive platforms hosted focus groups, questionnaires, and gave participants the opportunity to offer suggestions and express opinions. The goal was for all Libyans—including women and youth—to inform and contribute to the peace dialogue. The data from al-Hiwar fed into the Libyan Political Dialogue Forum which in turn supported the creation of the current Government of National Unity. Stakeholders recognized and agreed on the positive potential for public engagement on Facebook and similar platforms[69] as a complement to conventional and in-person outreach and dialogue tools.

In terms of facilitating feedback and customer service, most government entities have Facebook pages where they inform the public about their work and services. Citizens can leave comments, but these pages are not typically used for actual dialogue but rather as a dissemination channel.[70] LPTIC and GACI frequently post pending ideas on their website and allow the public to comment, in addition to hosting workshops and presentations.[71] Private sector stakeholders noted that this is not as frequent or open as desired and consultations are often limited to a select group.[72] Municipal governments also use social media to share updates and solicit comments from the public.[73]

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64 Government agency, Questions and responses exchanged by email with the DECA team, May 2021, online; Government agency, Interview by the DECA team, April 2021, online; CSO, Interview by the DECA team, April 2021, online; IT Consultant, Interview by the DECA team, May 2021, online.

65 Government agency, Interview by the DECA team, April 2021, online; International development project, Interview by the DECA team, April 2021, online.

66 USG, Interview by the DECA team, March 2021, online.

67 Additional source: A Light in Libya's Fog of Disinformation.

68 Additional source: Women and Youth Are Shaping Libya's Political Dialogue—but More Progress Is Needed for Inclusivity.

69 Think tank, Interview by the DECA team, April 2021, online; UN agency, Interview by the DECA team, April 2021, online; 2 International development projects, Interview by the DECA team, May 2021, online.

70 USG, Interview by the DECA team, April 2021, online.

71 Government agency, Interview by the DECA team,, April 2021, online.

72 Private sector organization, Interview by the DECA team, April 2021, online; Private sector organization, Interview by the DECA team, May 2021, online.

73 USG, Interview by the DECA team, March 2021, online.

Another avenue for digital engagement with the public is open data. The OECD's vision of open government data emphasizes the free use, reuse, and sharing of data for public benefit. Data use as a digital public good can contribute to increased transparency and accountability, increased citizen participation, and more data-driven decision-making. In their response to questions about open data, GIA mentioned direct sharing of data with researchers, government agencies, and international development institutions. When listing the primary users of public data, GIA did not include the press, journalists, or civil society groups, and stated that there is no standard procedure for Freedom of Information requests in Libya.[74]

2.2.3. THE POWER AND PERIL OF SOCIAL MEDIA

Digital dialogue and information platforms have created a way to connect and provide a wealth of information to Libyan citizens. At the same time, the media environment in Libya today has been described as highly polarized and partisan, with most outlets aligning with a regional or ideological faction. When journalism and comments are personality-driven and sensational they can exacerbate divisions and turn public sentiment against free press, civil society organizing, and spaces for free expression.

How information is weaponized

As noted in Pillar 1, six million people or 87 percent of Libya's population are active social media users and Facebook is their primary platform. It is the third most visited website (after Google and YouTube), with the average visitor spending approximately 19 minutes a day on it. Social media is well suited to the most common uses of the internet in Libya—socializing, news, and entertainment. As one interviewee put it, younger Libyans "live online… they will check online before they look out a window."[75]

Facebook's dominance has shaped Libya's information and media landscape. News outlets use Facebook to shift their content online. Hundreds of active pages are dedicated to national and local news, and Facebook serves as the main source of Libyan news for a large number of users inside and outside the country.

KEY TERMS | BOX 5: Malinformation, misinformation, and disinformation

Malinformation is the deliberate publication of private information for personal or private interest, as well as the deliberate manipulation of genuine content. Note that this information is based on reality but is used and disseminated to cause harm.

Misinformation is information that is false, but not intended to cause harm. For example, individuals who do not know a piece of information is false may spread it on social media in an attempt to be helpful.

Disinformation is false information that is deliberately created or disseminated with the express purpose of causing harm. Producers of disinformation typically have political, financial, psychological, or social motivations.

Source: USAID Disinformation Primer

Limited consumer media literacy in Libya presents a major hurdle in combating disinformation. While people may be aware of disinformation, they may not always be able to detect it. In a recent survey of 1,980 Libyan internet users, 99 percent of respondents believed that fake news is spread on the internet and social media,

74 Government agency, Questions and responses exchanged by email with the DECA team, May 2021, online.

75 USG, Interview by the DECA team, March 2021, online.

95 percent were concerned that the news they read may be fake, and 72 percent admitted having fallen for fake news, believing a story was real.[76]

Public concerns about the reliability of news media are well-founded. Media outlets and the level of journalism in general do not meet international standards of professionalism and the sector lacks capacity and sustainability. This contributes to increased political polarization, social divisions, and a lack of citizen trust in democratic processes, including skepticism about the ability of the press to act as a trusted watchdog.

Donors support CSOs that work to counter disinformation through increased media literacy. The American Bar Association and the Fezzan Libya Organization train youth in Libya's south to identify fake news and counter hate speech on social media. An innovative project implemented by the National Democratic Institute (NDI) teaches Boy Scouts to identify disinformation through community-level discussions, local and national campaigns, and gamification. Boy Scouts are widely viewed as credible in their communities.

BOX 9: Bridging divides through relatable content online

The Peace Against Violence Organization (PAVO) is a growing group of Libyan activists who focus on two pillars: (1) combating hate speech and (2) conflict resolution. The organization began its work on hate speech and social media through their 1.8 campaign.[77] Their goal was to combat hate speech based on gender, race, ethnicity, and migrant status. Campaigns rely on sarcasm and dark comedy to connect with audiences. PAVO attributes much online hate speech to a failure of the education system to teach about Libya's diverse identities and how to accept those differences. The 1.8 campaign features Libyans of different backgrounds—such as the Tuareg, Tabu, and Amazigh indigenous groups—highlighting their unique cultures and the stigmas they face. PAVO responds to current events (e.g., creating a space for discussions when a girl died due to harassment). In PAVO's view, these methods have opened up perspectives. By featuring all Libyans, the organization has gained trust from its followers.

Fuad Gritli is a Libyan media personality who uses satire to highlight political and social issues in Libya through his show called *Almakhzin*. His content and target audience change each season, but he has a following from every corner of society. According to Fuad, the viewership and distribution of news depends on how exciting the news is, not necessarily on its authenticity. He does his best to deliver authentic content through humor. Fuad often travels across Libya, particularly to the south and rural areas, to connect with the communities there and bring their stories to the rest of the country.

ONLINE ESCALATION AND REAL-WORLD CONSEQUENCES

According to a 2018 Amnesty International report, armed militias and their sympathizers routinely target female journalists, bloggers, and activists for their online activities. Attackers often begin by threatening violence through anonymous social media accounts, or launching online smear campaigns that accuse their targets of so-called crimes including blasphemy, atheism, adultery, or alcohol consumption. In addition to online abuse, women targeted by militias have faced beatings, kidnappings, and assassinations (including Fariha al-Barkawi, Salwa Bugaighis, and Intisar al-Hassari). Press freedom advocates continue to document human rights violations and killings in monthly reports from Libyan Crimes Watch.

The prevalence of violence used to silence and intimidate Libyan activists is a major obstacle to their participation in Libya's civic life. These attacks are coupled with a near complete absence of accountability or justice measures for perpetrators.

76 CSO, Interview by the DECA team, April 2021, online.

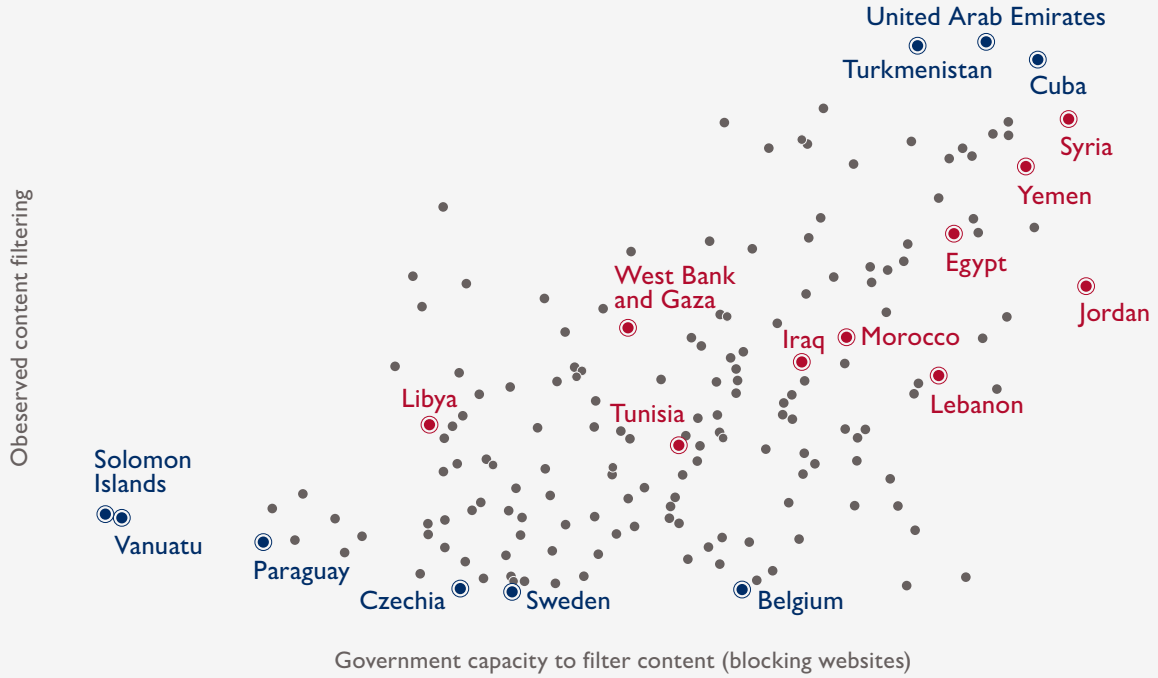
77 The total land area of Libya is about 1.8 sq km. The 1.8 campaign was so named to symbolize the desire to make Libyans' hearts as vast as the land area and create a space to respect differences.

Malicious actors frequently exploit rivalries and historical grievances among Libyan cities and towns. These geographic divisions can serve as substitutes for political affiliation, religious affiliation, or tribe. Geography is often used as an identification marker by social media actors to incite violence against specific groups.

Digital repression and self-censorship

Since the 2011 revolution, the political blocking of websites by government authorities has been infrequent. Facebook, YouTube, Twitter, and international blog-hosting services are freely available.[78] Authorities seldom request that private providers or intermediaries delete content. Comparison of Libya to its neighbors (see Figure 7) shows that the Libyan government censors online content less often than other countries in the region.

FIGURE 7: Online content filtering



Source: Digital Society Project (2021)

Instead, threats to online speech are more likely to come from non-state actors. Journalists increasingly practice self-censorship, using anonymous Facebook accounts to avoid offline threats. Militias and others utilize disinformation to pursue what has been termed censorship by noise or information dominance. Noise censors aim to spread cynicism and paralysis by disseminating obviously false or conflicting narratives, undermining a target's belief that the truth is knowable.

Several stakeholders mentioned efforts to become[79] verified content providers on Facebook. Interviewees expressed concerns that Facebook lacks the required understanding or language skills to adequately handle disinformation in Libya.[80] One CSO remarked that several of their posts highlighting disinformation—aimed

78 Google Transparency Report indicates no requests by Libya's government to remove content as of December 2021.

79 CSO, Interview by the DECA team, April 2021, online; International development organization, Interview by the DECA team, May 2021, online.

80 USG, Interview by the DECA team, March 2021, online.

at educating the public—were removed by Facebook for being fake posts themselves, likely due to the use of keywords. While they were able to utilize an appeals channel and ultimately had the content reposted, it had a negative impact on their operations. The appeals process is time-consuming, must be completed in English, and is adjudicated by an arbitrator with little to no background knowledge.[81]

BOX 10: CSOs in Libya's digital environment

A handful of CSOs and NGOs in Libya work on digital issues. These organizations typically focus on digital education, digital skills building, municipality support, and cybersecurity projects (e.g., LOICT, Moomken, Tanmia 360, Hexa Connection). Some organizations such as Hexa Connection and the Libyan Center for Freedom of Press have begun working on disinformation through their Annir.ly and Falso.ly platforms respectively. There is little work on highly sensitive digital rights issues such as censorship and online freedom of expression. Although the reasons behind this did not fully emerge in interviews, a few factors may have shaped the current landscape:

- The decade-long conflict has consumed most of the country's resources and attention.
- The mainstream use of digital tools and services has increased only recently—Facebook, among the most popular digital platforms in Libya, has seen a rise in the number of active users from 3.2 million in 2017 to 5.5 million in 2021 (out of a total population of 7 million).
- Censorship and digital repression in Libya are driven largely by non-state actors, rather than by the government. This can make advocacy and organizing around rights issues more difficult.
- There are relatively few digitally skilled workers available to support CSOs. This inhibits many CSOs from using technology in their own work, and makes it challenging for them to engage on digital issues with a large technical component.
- Smaller, local CSOs often lack the resources, funding, or capacity to focus on digital issues. Although CSOs have often filled gaps in government services and humanitarian relief activities, CSOs and NGOs that work with international funders are often distrusted by the government. This sometimes leads them to work on relatively safe topics that will not invite suspicion.

Most organizations working on digital issues are based in Tripoli or Benghazi with staff who speak English. Interviewees have stressed the need for international organizations to diversify and work with local organizations (such as PAVO and Fezzan Libya) who may understand more nuanced local contexts.

While many CSOs struggle to adopt digital tools (regardless of whether they focus explicitly on digital rights issues), some are tech savvy and use free online tools such as TechSoup, free web hosting, and other resources to build their organizations.[82] Tanmia 360, for example, provides training to other CSOs in technology and project management and aspires to create an open source NGO capacity building platform in Libya[83]. Moomken has a similar project.

CYBER RISKS TO CIVIL SOCIETY

Since the 2011 revolution, social media platforms such as Facebook and Twitter have been used as forums for activism and mobilization in Libya. Over the past few years, however, some observers have noted a shift to less overtly political topics of discussion, along with growing skepticism of the effectiveness of online activism. CSOs have had a complex relationship with digital platforms as tools to communicate and raise awareness, especially during the COVID-19 pandemic. While these are much needed communications platforms, they can

81 CSO/Media, Interview by the DECA team, May 2021, online.

82 CSO, Interview by the DECA team, March 2021, online.

83 ibid.

be a risk to the organization and to the safety of its members.[84] The informational element of the conflict has included disinformation campaigns that target CSOs and have tarnished the sector's image. These campaigns have accused CSOs that work with international donors and NGOs of promoting foreign agendas.

CSOs have limited ability to respond to these attacks. Few have designated media and communications staff. As a result, most CSOs have scant media coverage, making it difficult for them to build or reinforce a positive public image. Many CSOs practice self-censorship and maintain a low profile in order to decrease safety risks.

A minority of the CSOs interviewed have received cybersecurity training, typically through a donor who funds one of their projects.[85] CSOs report a lack of digital knowledge in general and in cyber hygiene and cybersecurity in particular.[86] The cybersecurity readiness level of online media outlets and CSOs is low, and the potential for compromised accounts makes them particularly vulnerable to impersonation campaigns or other cyberattacks.

84 CSO/Media, Interview by the DECA team, May 2021, online.

85 CSO, Interview by the DECA team, April 2021, online; CSO, Interview by the DECA team, March 2021, online; UN agency, Interview by the DECA team, May 2021, online; USG, Interview by the DECA team, April 2021, online; Academic organization, Interview by the DECA team, April 2021, online.

86 CSO, Interview by the DECA team, April 2021, online.

PILLAR 3: DIGITAL ECONOMY

Digital Economy explores the role digital technology plays in increasing economic opportunity and efficiency, trade and competitiveness, and global economic integration. Areas of inquiry include digital financial services (credit or debit cards, payment apps, mobile money, and digital savings and loan products), financial inclusion, regulation of digital finance, digital trade, e-commerce, and the financial technology (FinTech) enabling environment. This pillar also assesses strengths and weaknesses in the local digital talent pool and the tech startup environment; a healthy digital economy requires a supply of ICT skills that matches the demand and an ecosystem that promotes technological innovation.

KEY TAKEAWAYS: DIGITAL ECONOMY

- Libya lacks fundamental legal enablers such as e-signature and intellectual property laws.
- The CBL plays a critical role in the enabling environment and has faced a number of financial, monetary, and leadership crises that have affected Libya's banking system and eroded consumer trust.
- The current payments infrastructure is fragmented in both banking and e-wallet markets, preventing a seamless payment experience and inhibiting uptake.
- The formal education system and ICT training provided by international donor agencies are largely outdated and do not meet current industry needs.
- Libya's private sector is demonstrating its ability to innovate with workaround solutions to market limitations.

RELEVANT RECOMMENDATIONS

1. Promote inclusion and transparency in CBL's digital finance reform efforts through support for strategy and public communications efforts.
2. Establish capacity building and peer learning mechanisms for the CBL, driven by best practices and regional examples.
3. Support the CBL in facilitating the shift to electronic payments and in implementing the new national payment system project.

INTRODUCTION

Libya's digital economy has grown in the last few years, despite an unclear policy environment that lacks key enabling laws. Many of the constraints challenging Libya's digital economy are related to a fragmented payment system that makes it difficult to transfer money electronically, with cascading effects on digital finance, e-commerce, and trade.

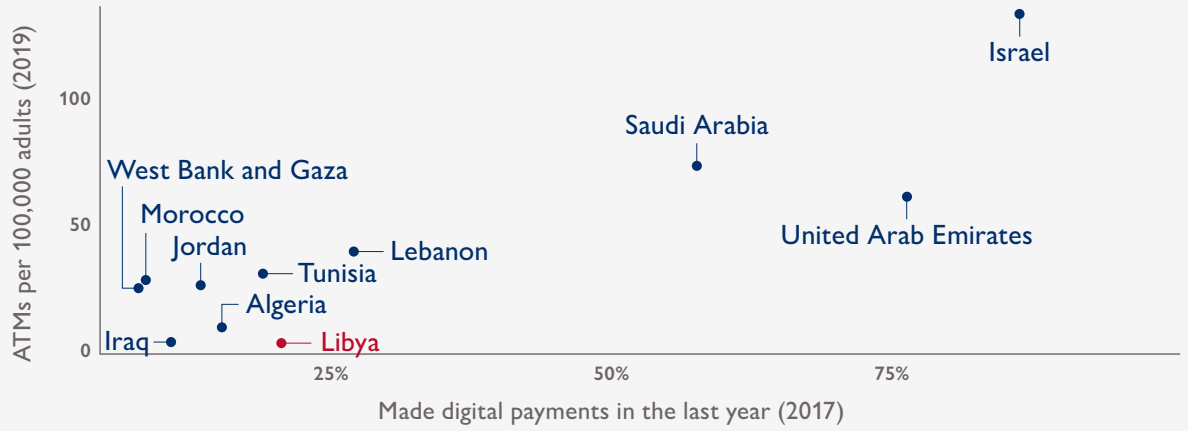
The digitalization of Libya's economy is creating new opportunities and showcasing the talents of Libyan entrepreneurs. Fostering their success will require clear and coherent rules to facilitate digital economic activities and make space for new market players.

2.3.1. SETTING THE STAGE: ENABLERS AND INHIBITORS IN LIBYA'S CURRENT DIGITAL ECONOMY

Digital finance is relatively new in Libya, and its evolution was shaped by existing conditions. Many Libyans already had accounts with formal banks, and a large fraction of workers were receiving formal salaries. At the same time, the banking sector was underperforming, with frequent liquidity shortages and cumbersome processes for transferring funds. Small businesses and consumers have been underserved for years.

TABLE 4: Libya's digital economy at a glance

INDICATOR	KEY STAKEHOLDERS
Regulator	Central Bank of Libya
e-wallet providers (licensed)	Sadad, Miza, Dinar Pay
Key FinTech providers	Tadawul Technology, Sadad, Miza, Masarat



Source: World Bank

Tech policy impacts the digital economy

The lack of clarity on fundamental tech policies and legal enablers inhibits the growth of Libya's digital economy. Consumers are faced with low quality services and products, weak consumer protection, and poor administration of their funds.

For some businesses this lack of clarity has been an advantage. Unclear licensing has enabled some e-commerce players and Value Added Service (VAS)[87] providers to gain access to the market simply through dialogue and rapport with government officials. This approach is not scalable and it is unfair.

87 VAS services are improved or enhanced versions of standard and basic core network services provided over telecommunication networks. Examples include voice calls, SMS, data management or data processing, financial services, and multimedia services.

TABLE 5: Fundamental digital economy legal/policy enablers

TYPE OF LEGISLATION	DESCRIPTION	RELEVANCE IN LIBYA
e-Transaction law	Places electronic commerce and paper-based commerce on the same legal footing. Establishes a legal foundation for the use of electronic communications in financial transactions.	No such law currently exists in Libya.
e-Signature law	Equates e-signatures and e-documents with paper-based signatures and paper documents. The United Nations Conference on Trade and Development (UNCTAD)'s model law on e-signatures addresses technical interoperability of standards, technological neutrality, and mutual recognition of certification agencies.	No such law currently exists in Libya.
Electronic receipt law	States that a digital receipt is sufficient to ensure legal compliance. Without this, electronic communications are not a valid proof of purchase. Electronic receipt law also benefits digital government by assuring citizens that their payments for government services were accepted.	Electronic receipts are not legally valid in Libya today.
Policy that recognizes mobile apps as products	Because software can easily be copied, developers rely on intellectual property protection (such as patents and copyrights) for a viable business. If mobile apps are not recognized as products, they will not be eligible for these protections.	Libyan trademark law[88] does not recognize a digital application as a product.[89] Businesses usually register a digital app as a written product[90] and sign non-disclosure agreements with vendors and technical providers.
Laws related to cybersecurity and consumer protection	Consumer protection frameworks govern what businesses can and cannot do with consumer data. Cybersecurity is essential in protecting consumer data and information.	In Libya, cybersecurity and consumer protection laws are missing key components and are not aligned with globally recognized standards.

The Financial Sector and the Central Bank

CBL plays a key role in the digital economy, regulating the flow of money and using monetary tools to stabilize the economy. Its responsibilities include consumer protection, security, and supervision of Libya's financial system.

Since 2014, Libya's challenges have included crises in the banking and finance sectors. A shutdown of Libya's oil fields by armed groups led to a shortage of foreign currency, which contributed to hyperinflation. This fed the growth of a robust black market. The split between Libya's eastern and western governments led to a division in CBL, creating two central banks issuing two different currencies with two different exchange rates.

88 A trademark is a word, phrase or logo that identifies a product or service and is used to distinguish itself from competitors. Trademark law is intended to protect established businesses from infringers who want to trick consumers into purchasing their products or services by capitalizing on a brand name.

89 Servo LY, Interview by Jill Shemin, April 2021, online.

90 Under Libya's IP law (division in the Ministry of Justice), written works are among those that can be registered for intellectual property protection.

This enabled high rates of illicit finance and the penetration of the banking sector by armed groups. Inflation and insecurity negatively affected consumer confidence, leading to higher withdrawal rates from banks and exacerbating the liquidity shortage. Hyperinflation reached its peak of 28.5 percent in 2017. For several years, many Libyans had limited access to their bank accounts and were prohibited from withdrawing cash or limited as to the amount they could withdraw.

BOX 11: CBL's split and ongoing reunification

In 2014, the political split between eastern and western Libya led to a fissure in the Central Bank. The internationally recognized bank was based in Tripoli and headed by Sadiq Al-Kabir (who had already served in this position for 10 years). In eastern Libya, an alternative central bank was headed by Ali al-Hibri. In addition to duplicate currencies and exchange rates, the split also meant two unconnected banking systems. Commercial banks still had branches in both regions, but the Tripoli-based CBL had no access to banking in the east and no ability to supervise AML/CFT activity.

In December 2020, the two central banks agreed to use a new unified exchange rate as part of a UN-led roadmap to full reunification. Reunification was intended to reconcile financial data and the balances of commercial banks, and to facilitate the purchase of foreign currency. In January 2021, both branches began using the new unified rate and devalued the dinar to combat Libya's hyperinflation problem. An April 2021 market update found that the prices of a number of imported goods had begun to fall. In July 2021, the CBL completed an audit, a key step toward reunifying the country's divided institutions.

Financial Inclusion: Cash & Digital

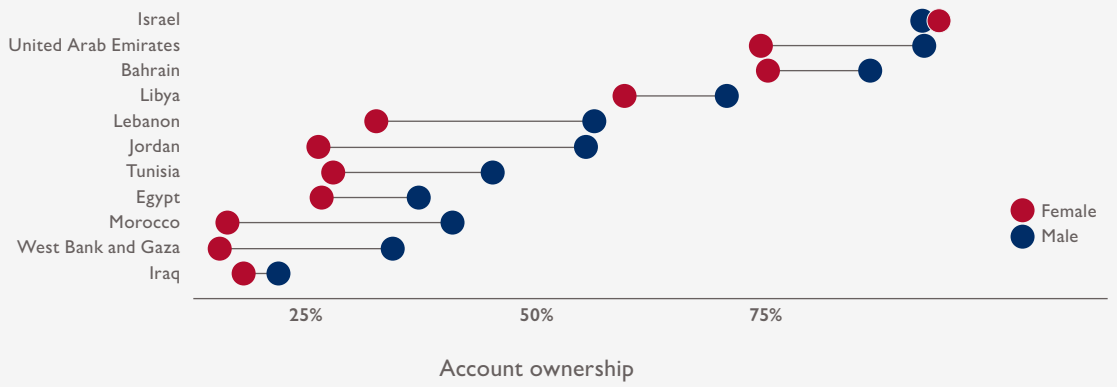
Libya is a predominantly cash-based economy,[91] with large amounts of currency saved in people's homes. Even under the best of conditions, it will take time to migrate cash into bank accounts and digital wallets.

Approximately two-thirds of Libyans have a bank account[92] and Libya is a regional leader for women's financial inclusion (see Figure 8). Unfortunately, the utility of those accounts is limited by inefficient interbank clearance and settlement processes, which make it difficult to transfer funds between accounts (see Section 2.3.2). Most accounts are only used to receive wages and to withdraw cash. Access to credit is almost non-existent for businesses, particularly small businesses. Saving and borrowing rates are high (60 percent and 50 percent, respectively) but largely informal.

91 Government agency, Interview by the DECA team, July 2021, online.

92 Additional source: Findex.

FIGURE 8: Gender and bank account ownership



Source: World Bank Global Findex, 2021

Only 43 percent of adult Libyan workers receive wages through an account at a financial institution, as opposed to being paid in cash. Public and private sector employees tend to be paid differently. In the public sector, more than 70 percent of wages are transferred via bank accounts, compared to only 21 percent in the private sector. Public salaries come largely from oil revenue (managed by the National Oil Corporation), and are directly transferred into bank accounts. Large public sector employers have sufficient scale to manage direct deposits in an assortment of non-interoperable bank accounts, whereas the MSMEs that dominate Libya's private sector are likely unable to afford the up front costs of account transfers.

BOX 12: Financial Inclusion for Refugees and Internally Displaced People

In Libya, Internally Displaced People (IDPs) do not face significant challenges in financial access as they have documents that meet Know-Your-Customer (KYC) requirements. Similarly, foreign nationals with proper identity documentation and residency permits are able to open bank accounts.

In contrast, refugees and asylum seekers tend to be excluded from financial access. In 2018, the NGO ACTED and the financial service provider ATIB provided electronic prepaid cards to 1,200 refugees and asylum seekers to facilitate receipt of humanitarian cash transfers. The prepaid card functions like a gift card and is not linked with a bank account. The card could be used at points of sale (shops and merchants), sparing their owners long waits at the bank.

UNHCR and other partners have tried to engage with the CBL, advocating for UN certificates and UN-issued refugee or asylum documents to be accepted as basic KYC documentation.

Aside from CBL, other government agencies regulate digital service providers such as e-commerce or VAS companies. Examples include the Ministry of Culture (involved in approving content or information apps) as well as LPTIC and GACI (see Pillar 1). As the telecom regulator, GACI is responsible for MNO services such as SMS and Unstructured Supplementary Service Data (USSD).

BOX 13: Alternative communication channels to internet-based applications: SMS and USSD

Digital finance providers rely on access to telecommunications channels, which are owned and controlled by MNOs.[93] SMS and USSD channels are particularly critical because they do not depend on internet connectivity. USSD channels allow users to start a service by entering a shortcode, without needing to download internet-based applications. SMS and USSD are often used for simple services such as receipt confirmation or completing a bill payment. Third party payment providers such as e-wallets are at the mercy of the MNO for USSD access unless the regulator establishes parameters around costs, access, and anti-competitive behavior.

Zain Libya provides a variety of VAS content from its international partners to operators like Libyana and Al Madar. Customers can subscribe to VAS content via a USSD code and pay through their existing mobile phone credit. Libyan users of Anghami (a regional music streaming service) can use this system to pay for daily or weekly subscriptions. This is possible because of Zain Libya's direct integration with the MNOs and the company takes advantage of the fact that Libyan law does not allow foreign companies to have a direct relationship with mobile operators.

2.3.2. DIGITAL FINANCE IN LIBYA

The existence, management, and regulation of digital finance is fundamental to the digital economy. In Libya, almost all digital finance products (e-wallets, debit cards, etc.) are linked to a bank account. This means that fragmentation in the banking sector will also affect digital financial services. For example, e-wallet providers must integrate with each individual bank, and transfers between different e-wallets (e.g., between Miza and Sadad) are generally not possible.

In many developing countries, digital finance began at a time when many people were unbanked. MNO-led mobile money products broadened financial inclusion, beginning with person-to-person (P2P) payments.[94] This trajectory is exemplified by Kenya's M-PESA. Libya's digital finance journey has been different. Libyans had high levels of bank account ownership before digital payments were introduced. Digital payments began with electronic cards, used in a point-of-sale network of ATMs and merchants. More recently, mobile tools such as e-wallets for online payments have entered the market.

BOX 14: Gaining merchant acceptance

Digital payments will only be adopted if people have somewhere to spend their money. Convincing merchants to accept digital payments requires offering them a way to receive payments and reconcile the money in their account that is at least as good as or is an improvement on a cash system.

This can be challenging. Providers face a chicken-and-egg problem: a payments solution is useless to customers unless there is a very large acceptance network of merchants. Merchants, on the other hand, will not be interested until there is a wide consumer base that demands digital payments. This means that digital payment providers must devote resources to training and onboarding merchants, in addition to promoting digital payments to recruit customers.

93 Private sector organization, Interview by the DECA team, March 2021, online.

94 P2P payments involve the transfer of money between two private individuals (such as remittances) rather than to a business or to the government.

BOX 15: Key terms and understanding the types of digital financial services

KEY TERMS:

- **Digital Financial Services (DFS):** Financial services that rely on digital technologies for delivery and use.
- **Payments Service Provider:** Companies that help merchants receive payments from their customers. They typically provide merchants with an account as well as a payment gateway that allows them to accept payment via credit or debit cards, or a mobile app. Payment service providers (PSP) include well known companies like Visa, Mastercard, or PayPal.
- **Payments Processors:** Third party service providers that handle the details of processing card transactions between merchants, the bank that issued the card, and the merchant's bank.

DFS TYPES:

- **Mobile banking:** Managing a bank account remotely via an app or a web browser.
- **Prepaid voucher or card:** Functions like a gift card that can be used at participating merchants. Prepaid vouchers, like cash, do not require significant KYC.
- **Debit card:** Affiliated with a bank account, functions at ATMs and at merchants like a credit card that debits directly from the affiliated bank account. Not functional for P2P transactions.
- **e-wallet:** A digital wallet that holds the equivalent of cash in digital form. E-wallets can store value and transact with participating vendors and persons that are on the same network as the e-wallet. E-wallets can function for P2P payments and merchant payments
- **Mobile money:** A service that includes transferring money and making and receiving payments using a mobile phone, without requiring access to a formal bank account. Uses an agent network of physical transaction points, outside of bank branches and ATMs, where customers can exchange account credit for cash.

IN LIBYA:

- Prepaid cards or vouchers can often be topped up by cash at a participating merchant, or via a bank account.
- An e-wallet provider is licensed to handle e-wallet KYC, which requires less documentation than a bank account.
- A customer is able to open an e-wallet without a connection to a bank account.
- e-wallets can receive money from multiple bank accounts, as long as banks are integrated with the e-wallet provider company.
- It is also possible to connect one bank account to multiple e-wallets.[95]

Payments system infrastructure in Libya: The National Switch and more

Libya had a low functioning banking system even during the previous regime. Until 2007, Libya had no unified automatic national payment system. Various components, such as check clearing or transfers, were siloed in separate departments with no integration. In 2007, CBL led a national payment system project which began a transition toward greater automation and integration. The CBL was able to link most of the banking system, but many payment systems still rely on a number of manual interfaces.

Payment system infrastructure includes multiple systems that participate in moving, settling, and reconciling money between people and businesses and their accounts. Banking systems operate smoothly and serve the market well when these systems are fully automated and well integrated.

95 Private sector organization, Interview by the DECA team, April 2021, online.

The national interbank switch is a key payment infrastructure system that connects banks to one another, enabling quick and automated transactions, and allowing ATM devices and Point-of-Sale (POS[96]) devices to serve multiple banks. Libya launched its National Switch[97] in 2003. Today, it is owned by CBL and managed by a quasi-public company called Moamalat. As of 2021, all five of Libya's state banks as well as 15 out of the 20 commercial banks were connected to the switch.[98]

In 2021, Moamalat began planning to shift to electronic payments, accelerate digital transformation of the banking sector, and promote e-commerce. The new strategy envisions a partnership between private-sector payment providers, commercial banks, and the National Switch. They plan to enhance the National Switch by creating a middle layer in Moamalat's infrastructure, operating between banks and the switch. This layer will serve as a technology enabler to the private sector and to merchants, making it easier to offer e-wallet and digital finance products and simpler for merchants to participate in e-commerce.[99]

Banks will be the cornerstone of Moamalat's payment infrastructure, and will interact directly with customers. This puts banks in a role to serve small, frequent P2P and merchant transactions.[100] Today, Libyan banks rely on a slower wholesale payment system that is designed for large transactions (see Figure 9). A retail system is accessible to individuals (similar to cash), and a wholesale system is accessible only to financial institutions. CBL's goal of offering direct account-to-account transfers and real-time settlement is technically feasible, but will reportedly require new legislation.

Cards and Point-of-Sale network in Libya

POS card payments were introduced in 2015, when banks were allowed to create debit card accounts and issue debit cards. Usage increased rapidly, driven by the liquidity crisis and limits on withdrawals at banks. At the time, the business sector was struggling with liquidity and moved quickly to accept card payments, which enabled adoption by their customers.

Interviewees claimed that merchant POS and ATMs are only able to serve individual banks, due to problems with the interbank switch. This means that merchants are required to operate a different POS device and hold an account in each bank for every different bank-issued card.[101] This generates significant costs for merchants and marginalizes customers of poorly-connected banks.

96 Point-of-sale (POS) devices are transaction devices at the retail level, such as traditional card-swiping devices at merchants or ATMs. POS devices are relatively expensive for processing credit and debit card transactions. Mobile POS devices (mPOS), on the other hand, utilize smartphones to process digital transactions.

97 A multilateral settlement system and also an interbank network; can serve as the ATM consortium. The service offers financial institutions involved in multilateral settlement arrangements a means to settle the obligations that arise under that arrangement.

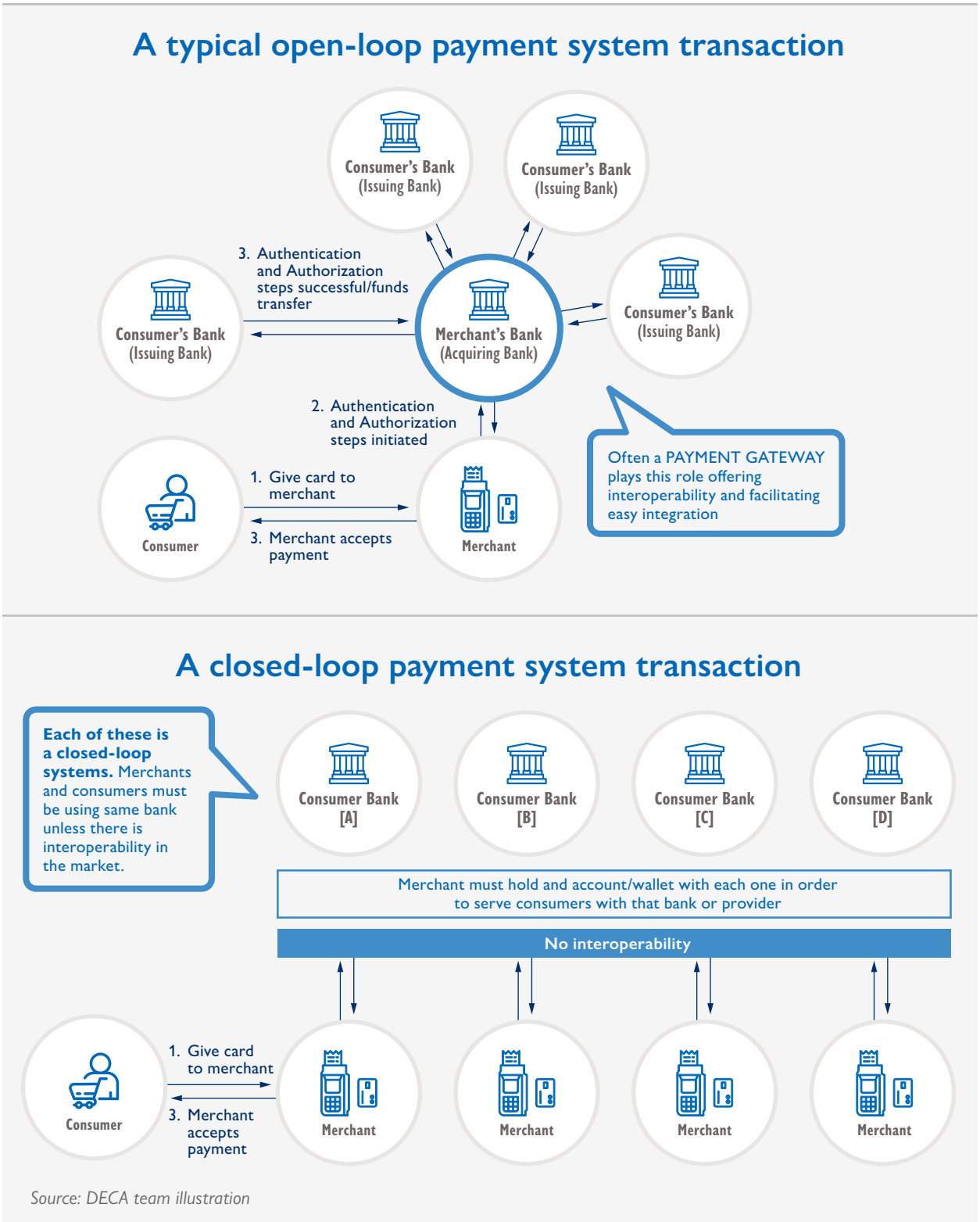
98 Government agency, Interview by the DECA team,, July 2021, online.

99 ibid.

100 ibid.

101 There are only bank-issued cards or prepaid cards in Libya, no credit cards. (Except for a very recent one launched by AMMAN bank.)

FIGURE 9: Open-loop vs closed loop payment systems



Source: DECA team illustration

In response to the liquidity crisis, the CBL allowed the issuing of international debit cards, designed for use abroad. These cards could be used to withdraw foreign currency abroad, which could be used in Libya when inflation of the dinar was very high. International debit cards were implicated in fraud schemes as wealthier

Libyans rented accounts from those who could not afford the required minimum account balance.[102] The international debit cards require a minimum account balance of $10,000 USD annually and have limited daily withdrawal amounts, and are issued to work with the international finance system. They cannot be used at ATMs or POS in Libya.

Beyond cards: e-wallets and the future of digital finance in Libya

The e-wallet market was poorly regulated from early on. Many providers were improperly licensed or illegal with a bank account and address in another country. Some were shut down,[103] but there are reports that some unlicensed e-wallets continue to operate. This is particularly true in the eastern region, which was poorly supervised during the central bank split. Other providers have shut down as their business model was poor and their fees were too high (such as *Flooz-E* or T-pay.) According to CBL, only three providers currently hold an e-wallet license; two launched in 2017: *Sadad* and *Miza*.

The lack of interoperability contributes to fragmentation. A lack of clarity regarding providers in the market may be related to CBL's licensing process. According to the CBL, when they first grant an e-wallet license they offer a one-year pilot period to test the product. New applicants are only allowed to pilot one product at a time.

Many businesses feel that there is no single reliable payment solution in the country. It is common to hear that there are few real e-wallet providers, or a couple of market leaders in the larger underperforming environment. The sections below describe a few of Libya's market leaders.

Sadad: Libya's mobile money

One of the two parastatal MNOs, Al Madar, launched a mobile money e-wallet called Sadad in 2017. Al Madar reportedly has more than 5 million telecom subscribers and some 133,000 subscribe to Sadad. The e-wallet product operates like a mobile money platform, although the term "mobile money" is not generally used in Libya. The balance in Sadad wallets corresponds to money held in an Al Madar bank account, under the supervision of CBL.

Given Al Madar's broad subscriber base, it is striking that so few of their customers use Sadad. One interviewee (from a competing company) noted that Sadad's challenges are tied to interoperability: "If you look at Sadad today they are not around—you'd think as an MNO with over 2 million subscribers you'd expect them [subscribers] all to use Sadad. But their subscribers all have different accounts across 17 different banks….[104]" This means that Sadad has to integrate with many banks, or consumers are limited to topping up their wallet with cash at participating merchants.

Tadawul Technology: Driving merchant acceptance via speedy reconciliation

Tadawul Technology launched in 2016 with prepaid cards and a payment system that manages settlement accounts in multiple banks. Their goal was to offer merchants speedy reconciliation during the liquidity crisis. Tadawul is affiliated with ATIB Bank, which holds 10 percent ownership and is a strategic partner.

Tadawul has created a hybrid system with multiple settlement accounts, each held with a different partner bank. This has enabled them to build a multibank network to facilitate top-ups for card holders. Tadawul's system allows its partner banks to issue both debit cards and prepaid cards. They create pool accounts at each

102 DECA Team notes from T. Elmogrbi.

103 Private sector company, Interview by the DECA team, May 2021, online.

104 ibid.

bank and settle their own accounts in order to offer fast reconciliation to merchants. This requires them to hold a large amount of liquidity in multiple banks. Today Tadawul holds a pooled account in each of the 17 banks in Libya. An interview with Tadawul revealed that a number of large corporations have adopted their services to facilitate salary payments, allowing their staff to have immediate access to their salaries.

In 2016, CBL granted Tadawul a PSP license. This allowed Tadawul to become an authorized payment processor, breaking the monopoly that had been in place for two decades. Today, Tadawul is the largest payment provider in Libya and the largest acceptance network with over 8,000 POS. Their network continues to add some 300 POS per month, with the south as a priority location.

Libyan Spider: Internal innovations to streamline payments

Libyan Spider offers a wide variety of IT services and cloud business solutions. In order to successfully offer their products and services to a range of different clientele, they have to accept many forms of payment. Frustrated with the digital payment environment in Libya, Spider's software developers wrote their own internal high quality Application Programming Interfaces (API) documentation[105] for each payment provider. APIs allow different pieces of software to "talk" to one another, so that (for example) an e-commerce page can connect directly to a payment provider. Good API documentation simplifies the process of integrating payment providers. Once Libyan Spider had created API documentation to serve their own business, they began to offer it to their clients.

Libyan Spider is not a payment provider. They hold no money, no value, no wallets, and perform no transfers. They do not offer a consumer-facing e-wallet nor do they offer the infrastructure behind it. They offer organized and clear guidance—the documentation to simplify the integration process. This is an important ecosystem role, enabling online businesses to serve customers with more payment options.

Although the current environment for digital finance can be inhibiting, the examples of Tadawul and Libyan Spider exemplify the innovation in the private sector. There are also innovations going to market in virtual and remote services (account opening, branchless banking), cardless services (cardless ATM withdrawals),[106] and new payments use-cases (such as electricity bill payment[107]). Multiple players have expressed hopes of becoming a digital bank in the next five years; some have begun the process.

2.3.3. THE SOUK GOES DIGITAL: E-COMMERCE IN LIBYA

E-commerce businesses are growing in Libya amid signs of robust demand. Internet shoppers account for 20 percent of internet users and 14.6 percent of the population. In 2018, Libya had the highest proportion of online shoppers on the continent and ranked 13th in Africa in e-commerce readiness. One interviewee estimated that Libya is home to some 30 startups that use some form of e-commerce.

105 Application Programming Interfaces (APIs) are only as good as their documentation. API documentation is written text (or reference manual) that accompanies an API, containing instructions about how to effectively use and integrate with an API. It is a concise reference manual containing all the information required to work with the API.

106 2 Private sector organizations, Interview by the DECA team, April 2021, online.

107 Private sector organization, Interview by the DECA team, April 2021, online.

KEY TERMS | BOX 6: E-commerce and Digital Trade

E-commerce: OECD defines e-commerce as "the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders." E-commerce may be conducted through formal (e.g., Amazon, Etsy) and informal (e.g., Facebook, WhatsApp) digital platforms. Physical goods may need to be shipped domestically or overseas; virtual goods and services (such as streaming video or telehealth consultations) can be delivered digitally. In addition to digital tools (such as payment platforms), e-commerce depends on physical infrastructure for the warehousing and delivery of goods. E-commerce growth has implications for traditional methods of cross-border trade and domestic transport infrastructure, postal, and logistics systems.

Digital Trade: The U.S. International Trade Commission defines digital trade as "The delivery of products and services over the internet by firms in any industry sector, and of associated products such as smartphones and internet-connected sensors." This includes services such as cloud storage, software-as-a-service, banking and e-commerce platforms, and digital media content, as well as ICT hardware.

E-commerce focuses on the purchase and delivery of physical goods, while digital trade takes a broader view, including trade in digital services and media and emphasizing cross-border transactions. Digital trade facilitation refers to a range of topics from international payment services to e-signatures and digitized customs processes.

Popular e-commerce models in Libya

A range of e-commerce models can be found in a growing digital economy. Figure 10 shows one way of categorizing them.

Model A dominates in Libya today, with many small- and medium-size vendors relying on Facebook Marketplace. This approach to e-commerce is more informal and has been found (in other markets) to be more inclusive of women as both sellers and customers. Libya is also home to e-commerce players like Dokkan and Spiza, whose approach is closer to Model C.

E-commerce players that operate as a full-service platform solution like Model B or C need seamless integration with payment services to serve the buyers and sellers on their platform. The following section details how payment systems support or inhibit e-commerce.

FIGURE 10: Explaining various e-commerce models

Source: DECA team illustration

	Model A	Model B	Model C
Role of platform	Sellers post their goods for sale and buyers use the e-commerce platform to connect with them. The remainder of transactions are done offline/outside othe platform.	Sellers post their goods for sale and buyers use the e-commerce platform to connect with them and conduct the transaction. It allows payment and shipping/ delivery to be done through the platform.	Provides the customer a full customer fulfillment solution, including a connection to the seller, payment and delivery options, often the managing the inventory in warehouses, and more. Unlike Etsy or other platforms, these models (especially Amazon) retails its own Amazon products.
Degree of streamlined consumer experience	No. There are limiations on the extent to which these platforms can integrate with other applications and services. After connecting buyer and seller, the remainder of the transaction (payments, identifying logistics of delivery, exchange) is completed outside the platform.	Somewhat. Shipping and payment logistics are offered on the platform, however, it is common for the vendors to manage these. There is overall less oversight of vendors by the platform (i.e., the common operation is that each vendor can have their own individual return pollicy) and a less standardized customer experience. As platform itself, it is much less powerful than platforms that provide a fully integrated transaction.	Yes, The platform provides a level of consistency to users, often focuses more on customer service, and has a much more established and standardized relationship with vendors for scability. These businesses investin and deploy enterprise manage-ment, client management, and data management tools and they become data engines themselves.
Business model	Mostly limited to classified and ads or charging for premium seller posting.	Customer service and platform services are less consistent or standardized. For example, where a model like Amazon takes the money from transactions, then paying a fee to third-party seller, eBay primarliy takes a fee on a successful transaction.	The business model generates revenue from transaction fees and ads and promos, and more frequently data analytics. A key strenght of a model like this is on managing the cash generated through the most out of the data generated).

Payments: The main issue for e-commerce in Libya

Libyan e-commerce providers rely overwhelmingly on cash on delivery. The fragmented payments system is a huge barrier for e-commerce businesses, given their need to manage payments for vendors, customers, and their own staff (logistics and drivers). E-commerce cannot reach its potential without broader uptake of digital payments services, and e-commerce companies must be able to serve customers who use a variety of payment tools.

Libyan businesses are finding innovative solutions to these systemic challenges. In interviews, multiple e-commerce companies described how they circumvented the e-payments system by creating their own internal account or voucher systems to manage payments among customers, vendors, delivery services, and the platform. For example, one company needed to collect payment from drivers and manage the liquidity rapidly to accommodate their sales and operations, so they created an internal voucher system where drivers buy vouchers to cover costs instead of carrying and managing cash.

Steps toward digital trade facilitation

Compared to other MENA countries, Libya is far behind in both trade policy and digital trade facilitation, such as modern online software systems that facilitate trade and customs processes. Many countries in the region[108] are members of the World Trade Organization (WTO) which means they have improved efficiency, expanded public-private cooperation with traders and trade authorities, and trusted traders with minimum documentation to clear cargo. There are also challenges with the transparency of trade regulation. The 2020 *Digital Trade Regulatory Readiness for the MENA Region* report was unable to find sufficient information to evaluate Libya with regard to digital trade regulation.

Recent initiatives highlight the interest of Libyan trade authorities in implementing digital tools, along with the challenges they face. In January 2021, the GNA's Ministry of Finance launched an Electronic Cargo Tracking Note (ECTN) for imports at seaports. Critics of the ECTN, including the Libya General Union of Chambers of Commerce, claimed that the system created bottlenecks at Libya's ports and delayed the release of goods. As of February 2021, the ECTN initiative was under review by the Audit Bureau. Regardless of its fate, the ECTN reflects a broader interest in trade digitalization. Another tracking platform was launched in March 2021.

Another promising area of trade digitalization is the online publication of trade laws, beginning in January 2021. Pricing of the electronic tracking documents is posted in English and lists the requirements to obtain an ECTN.

108 According to the WTO's membership map (accessed March 2022), Algeria, Libya, Lebanon, Syria, Iraq, and Iran are still not members.

BOX 16: UNCTAD's Automated System for Customs Data, or ASYCUDA

ASYCUDA World, UNCTAD's Automated System for Customs Data, is the most widely used customs software system around the world. ASYCUDA is typically offered free to developing countries that have the ability to adapt the system to local conditions. More advanced software applications are designed and developed for customs administrations and the trade community to comply with international standards. Once the system has been installed, UNCTAD continues to assist in software maintenance and provides system updates. The software is meant to provide a quick solution for countries that do not have the human or capital resources to develop their own customs information systems. Professionals familiar with ASYCUDA acknowledge challenges with UNCTAD's capacity and responsiveness and the frequency of software updates.

UNCTAD supported the launch of an ASYCUDA World prototype for Libya in early 2021. The pilot process will reportedly take up to another 12–18 months before official rollout can begin.

2.3.4. ENTREPRENEURSHIP, DIGITAL TALENT, AND THE DIGITAL STARTUP LANDSCAPE

Libya's tech startup landscape is growing, with a recent rise in entrepreneurial culture. In the last few years, digital entrepreneurs and ICT professionals have demonstrated more passion, interest, and creativity in finding innovative solutions to address Libya's market gaps. A dearth of relevant skills, limited business acumen, and constrained funding continue to present barriers to the sector's growth.

An emerging entrepreneurial culture

Entrepreneurial culture is relatively new in the country, due to a history of dominant state-run enterprises and generally slow development of the SME sector. The last decade has seen the growth of an ecosystem supporting entrepreneurship, including incubators and business skills training programs.

A consultant at the Benghazi University Incubator shared their view of how entrepreneurial culture has changed in Libya in less than a decade. When the incubator was established in 2012 and students were asked what entrepreneurship meant, they could not provide a good definition of the term. In 2021, students are far more aware. They are generating application ideas (both digital and non-digital) that they would like to implement and are aware of successful entrepreneurs locally and internationally. "It's a new culture on the street—everyone is aware of it, especially the younger generation." The interviewee attributed this increased awareness to financial and awareness-raising support from both local and international organizations.

Building Libya's digital workforce

Engineering has historically been a very well-respected degree and professional field in Libya. But interviewees felt that the quality of Libyan higher education has declined over the years.[109] In Science, Technology, Engineering, and Mathematics (STEM) fields, universities teach outdated curricula that do not prepare graduates for the real world. Coursework is theory-oriented with little emphasis on societal applications, case studies, or problem-solving. Industry needs are often neglected. This criticism also applies to many short-term training programs that are funded by international agencies; interviewees claim that they bring the same training curricula year after year with no updates based on current market needs.[110] As a result, private companies commonly hire international staff to do the bulk of their technical work.

109 International development project, Interview by the DECA team, April 2021, online.

110 Academic incubator, Interview by the DECA team,, April 2021, online.

Many Libyans take it upon themselves to acquire ICT skills. Graduates and graduating students take additional online courses or participate in training programs designed to help them prepare for the real world. University degrees are often seen as merely an official credential. As one interviewee put it, "The goal is to have the degree to be able to work, then to build our skills."

Recent progress in building a culture of technology entrepreneurship should be viewed in light of the history of Libya's IT sector. As the most developed industry in Libya, the oil industry was an early source of demand for IT talent. International IT companies mainly serve the oil sector as government contractors, and Libya's digital talent pool has traditionally been fueled by oil money. International companies often bring in expatriate foreign workers, and skill transfer to the local Libyan workforce has been negligible. Libyan professionals have grown accustomed to foreign experts doing the technical work. When Libyan IT professionals gain skills in enterprise-grade systems, they often go abroad where their advanced skill set is better compensated.

BOX 17: Digital skills building initiatives in Libya

Recent digital skills initiatives have typically been donor-funded or supported and often tend to be scattered and disconnected. They face roadblocks in terms of sustainable funding, or lack the right expertise to provide insightful advice and training. A few noteworthy examples are listed below.

Incubators for skills building: Several incubators have emerged in Libya with the aim to support entrepreneurs. While some (such as the Benghazi University Incubator) support both technology-related and non-digital initiatives, others such as Stream Incubator and Tatweer Research focus directly on technology.

- Stream Incubator, started in 2018 with funding from the UK and sponsorship by Libyana, in cooperation with the Ministry of Planning. Recently Stream has been fully absorbed into Libyana's Research & Development Division. They run two programs, one focused on early-stage incubation and one on the acceleration of graduates from the incubator program. Stream and Libyana have plans to open incubator offices in cities throughout Libya.
- Tatweer Research is another player in the start-up ecosystem that is highly focused on technology and the knowledge economy. Tatweer is unique in the ecosystem in that it is a commercially-driven enterprise and within a division of the Libyan Local Investment and Developments Fund. It has built out its program with outside funding, and launched Tatweer Entrepreneurship Campus *with* EU and UNDP support.

Skills building for tertiary students and new graduates: In addition to support for entrepreneurs, there are initiatives to transfer knowledge to tertiary level students and beyond.

- **Donor-level support** IInternational organizations and foreign government partners are among the main supporters of entrepreneurship and private sector development in Libya (such as USAID (through LEE) and Expertise France). These initiatives are often run by CSOs or think tanks such as Jusoor, Moomken, and Tanmia 360.

Expertise France, which has been active in business environment improvement and private enterprise development in Libya for years, also has a program with the Ministry of Higher Education to set up an entrepreneurship and innovation center at each of Libya's 12 universities. They plan to introduce a bachelor level curriculum on entrepreneurship to be placed in the Faculties of Engineering, Economics, and IT.[111]

111 Academic Incubator, Interview by the DECA team, April 2021, online; International development organization, Interview by the DECA team, April 2021, online.

BOX 17 (CONTINUED): Digital skills building initiatives in Libya

- **Public sector support:** In addition to the Benghazi University Incubator funded by the National Program for SMEs, LPTIC has plans to establish an ICT Academy. The goal of the ICT Academy is to set up a training institute allowing graduates to obtain and maintain skills for work in IT or other relevant sectors. A secondary goal is to allow young graduates to learn team and leadership skills so they can become future leaders. Planning for the ICT Academy began in 2014, but it was put on hold due to the conflict. While they have funding, LPTIC believes their biggest challenge is finding expertise and management knowhow. They are seeking stakeholders to participate in the Academy. Huawei has expressed an interest in investing in the Academy, and LPTIC has signed an MOU with Ericsson. As of April 2020, Ericsson began offering webinars to Universities through their Connect to Learn initiative.

Women in the digital economy

USAID's 2020 Libya Gender Analysis highlights the constraints and opportunities faced by Libyan women. It discusses how legislation, social and cultural norms and practices, access to resources, and the physical environment shape women's agency and experiences. Women generally have limited access to computers, limited digital literacy, and relatively restricted access to the internet. However, the conflict and COVID-19 have been drivers of increased online participation of women (especially those living in highly-connected cities like Tripoli and Benghazi). The report recommends investing in women's online networking and learning opportunities, along with digital literacy and cybersecurity.

Interviewees generally felt that women and girls do not face barriers in gaining STEM/ICT education at the tertiary level. A few university-based interviewees recalled having more women than men in their departments. The situation changes, however, when women enter the workforce. Companies reportedly do not feel comfortable hiring female engineers because of physical risks if they are sent to the field, especially at night. Female engineers are often steered toward administrative or office work. Female interviewees recounted having a harder time establishing their presence as leaders in the male-dominated ICT industry. Despite gender barriers in the traditional ICT sector, women are making inroads in other areas, particularly with jobs such as web design that can be done from home. Women also seem to be more involved in informal e-commerce using Facebook. Some have experienced incredible success from beauty- or food-related online businesses.

Are there tech startups in Libya?

The decade-long conflict and COVID-19 have spurred the creation of new and innovative tech startups in Libya, such as the food delivery app Spiza that has ambitions to turn into an integrated e-commerce platform, or the ride-sharing app Servo. There is a growing support ecosystem for start-ups. Compared to other businesses, tech startups often require less initial start-up capital and have the ability to hire staff that can be self-taught and flexible. Libyan youth are showing interest and passion in building digital tools and companies.

Libya's digital startups exhibit characteristics that one would expect to see in an environment with a stronger and better-established digital startup culture. One is that digital startups seem to have a deep understanding of the value of building customer loyalty and have a focus on pleasing the customer. Another is that they appear to be data-focused, seeing each interaction, no matter how small, as a data point that builds their relationship and knowledge of their customers and customer preferences.

Many digital and e-commerce start-ups provide free services to cement customer loyalty, a long-term strategy to maintain usage by vendors and customers. E-commerce companies may assist vendors in posting their goods

for sale on their platform. Even small companies may dedicate time to walking customers through simple processes such as downloading an app.

Tech startups consistently cite access to finance as their biggest challenge. In general, there is a low level of lending to small businesses in Libya. Only 2 percent of private firms reported having a loan or credit from a bank. The credit that is extended goes to very large firms or those who already have substantial assets to use for collateral. Libya also lacks a well-functioning credit bureau which further hurts access to finance for small and medium-sized enterprises (SMEs). Venture financing (a form of financing designed for startups) is generally a foreign concept and there is likely no legal framework for it.

TABLE 6: Differences between startups and micro, small, and medium-sized enterprises (MSMEs)

	STARTUP	MSME
Rate of growth	Scales quickly; often loses money before reaching a profitable scale	Growth is not always the goal; provides stable employment for proprietors
Size	Grows exponentially to be able to compete globally	Any size that is sustainable
Funding	Venture capital or angel investors—ideally investors that can take risks and absorb losses	Usually banks, personal finance, or other forms of funding

Incubator programs generally do not offer financing or grant opportunities.[112] They describe their role as introducing participants to financing players like banks or international players (NGOs or grant-makers.) Exceptions include Stream Incubator, which offers grants (40,000 Libyan dinar, or about $8,700 USD) as part of its program, and Expertise France's financing mechanisms for Libyan entrepreneurs.

112 One interviewee mentioned a Libyan Loan Institution which offered financial support to businesses; however, it has been inactive since 2014.

SECTION 3:

Recommendations

The international development community can support and strengthen Libya's digital ecosystem in many ways. This section outlines recommendations for specific actions and partnerships as well as general guidance for digitally-enabled programming. The list is organized by cross-cutting themes and DECA pillars.

Table 7 summarizes each recommendation as follows:

What: links to the recommendation details
Why: provides the motivation or intended impact of the recommendation
How: summarizes the approach USAID/Libya can use to implement the recommendation

The detailed recommendations section that follows provides further explanation of how the international development community can implement each recommendation, including:

- Relevant context;
- Key opportunities to draw on and align with the Principles for Digital Development and the SDGs.

When acting on any of these recommendations, information on best practices in digital development program design is valuable. The Principles for Digital Development[113] is a helpful resource. USAID's Digital Investment Tool was designed to help USAID staff apply the Principles for Digital Development in program implementation, but may be of interest for other development organizations. The section below provides background and guidance on how to use these resources.

113 These principles are nine living guidelines that provide best practices for every phase of the project life cycle. They were created in consultation with various international development organizations, including USAID.

TABLE 7: Summary of DECA recommendations

	WHAT?	WHY?	HOW?
CROSS-CUTTING			
1	Strengthen cybersecurity capacity through civil society engagement and workforce development	Enhanced cybersecurity both internally and externally.	Create a digital security activity for civil society, and advocate for cybersecurity workforce development. Advocate for government procurement of secure technology.
2	Embed digital literacy throughout development programs	Increased trust and safe use and adoption of digital tools and services.	Conduct deep-dive research and understand gaps in user-level digital literacy and cyber hygiene. Build a community of practice for good cyber hygiene.
3	Promote the Principles for Digital Development with donors, partners and the government	Increased awareness and coordinated implementation of digital principles.	Convene and coordinate roundtables on the Principles for Digital Development.
PILLAR 1: DIGITAL INFRASTRUCTURE AND ADOPTION			
4	Expand connectivity to the last-mile with infrastructure financing reform and new connectivity technologies	Reduced digital divides and increased connectivity for all.	Connect stakeholders to promote a competitive telecom market. Conduct feasibility studies on new connectivity technologies such as 5G FWA. Meet with the Digital Inclusion team (in the USAID DDI/ITR Hub's Technology Division) to brainstorm potential funding options for last-mile expansion.
5	Support information and communications technology (ICT) workforce development through university partnerships and upskilling initiatives	Strengthened digital workforce capacity.	Collaborate with relevant stakeholders to improve university curricula focused on technology and cybersecurity. Partner with local organizations to train the existing workforce in basic digital skills.
PILLAR 2: DIGITAL SOCIETY, RIGHTS, AND GOVERNANCE			
6	Counter online disinformation by partnering with Libyan change agents and engaging platform companies	Increased resilience against disinformation and cyber harms.	Build on successful initiatives and engage a broader community to stand up and speak out against disinformation and digital rights violations. Expand efforts on civic education and media literacy to focus on disinformation.
7	Promote reconciliation by leveraging citizen journalism and Libya's storytelling culture on social media platforms	Increased community engagement and understanding, reduced polarization.	Counter mis-, dis-, and malinformation by supporting responsible citizen journalism. Build on existing offline activities to improve community engagement and address drivers of conflict.

	WHAT?	WHY?	HOW?
8	Bolster digital government initiatives through research, intergovernmental exchanges, donor coordination, and embedded technical advisors	Engage a broader community to stand up and speak out against disinformation and digital rights violations. Expand efforts on civic education and media literacy to focus on disinformation.	Sponsor research and co-create strategies to support the enabling environment. Embed technical advisors and leverage interagency experts for intergovernmental knowledge sharing. Support larger donor initiatives.
9	Ensure that HNEC's future plans for biometric voter registration account for human rights and privacy issues	Counter mis-, dis-, and malinformation by supporting responsible citizen journalism.	Advocate for a consultative, open approach to HNEC's planning for biometric voter registration and provide technical targeted assistance as needed.
10	Support legal reforms to promote digital development and the protection of human rights online	Strengthened enabling environment for the digital ecosystem.	Advocate for the inclusion of digital language in laws and regulations and provide technical assistance (TA) as needed, and provide TA to help the Libyan government draft new laws and new regulations.
11	Promote coordination through a multistakeholder internet governance forum and a government-wide Office of Digital Initiatives	Strengthened internet governance.	Advocate for a multistakeholder internet governance body, such as a country-level Internet Governance Forum (IGF) initiative, and if agreed, provide TA to the group. Recommend a central government point of contact, such as an Office of Digital Initiatives.
	PILLAR 3: DIGITAL ECONOMY		
12	Promote inclusion and transparency in CBL's digital finance reform efforts through support to strategy and public communications efforts	Decreased policy barriers to digital finance adoption and innovation.	Advise the government to create a strategic framework to improve financial services for all.
13	Establish capacity building and peer learning mechanisms for the CBL driven by best practices and regional examples	Better informed digital finance policies with stronger connections to regional neighbors	Express support for CBL's efforts to reform Moamalat and the National Switch and build out the National Payments Council. Sponsor or facilitate the CBL's membership in the Alliance for Financial Inclusion.
14	Support the CBL in facilitating the shift to electronic payments and in implementing the new national payment system project	Shift to digital payments.	Support the government as they deploy a retail payment system, and scale merchant uptake and promote interoperability of electronic payments through TA. Support the development of a regulatory innovation facility.

DETAILED RECOMMENDATIONS

1. STRENGTHEN CYBERSECURITY CAPACITY THROUGH CIVIL SOCIETY ENGAGEMENT AND WORKFORCE DEVELOPMENT

Interviewees across stakeholder groups described a situation in which cyber threats are not taken seriously and awareness of effective defense measures is low. The following steps can be taken to support digital security in Libya:

A. Create a digital security activity civil society: Libyan CSOs have varying degrees of digital hygiene and cybersecurity knowledge. Given their high levels of Facebook use, they often face physical or reputational threats on social media. These organizations may not have enterprise IT solutions for data storage and communication, instead relying on off-the-shelf products like Google or Yahoo. The international development community can help CSOs adopt processes and practices to identify, mitigate, and respond to a constantly changing threat landscape through technical assistance and training.

B. Advocate for cybersecurity workforce development: There is a clear shortage of trained cybersecurity professionals in Libya. The international development community can provide technical assistance to local universities or other workforce development initiatives like LPTIC's ICT Academy to design cybersecurity curricula.

2. EMBED DIGITAL LITERACY THROUGHOUT DEVELOPMENT PROGRAMS

Increased familiarity with digital tools and services, paired with knowledge of one's basic rights on the internet can help alleviate mistrust of digital services that exists among many Libyans. In line with the Digital Principle to address privacy and security, The international development community can:

A. Promote research to better understand privacy and security from users' perspectives, taking account of the views of women and other marginalized populations (ethnic minorities, persons with disabilities, and so on), and exploring diverse geographic, socioeconomic, and demographic contexts. This will allow stakeholders in the cyber hygiene field to build targeted program design around users' wants and needs.

B. Build a community around user-oriented cybersecurity: Donors and implementers can work together to document cybersecurity trends and learn from successful cyber resilience interventions. Monthly or quarterly check-ins on digital development projects can strengthen coordination between donors and implementers.

3. PROMOTE THE PRINCIPLES FOR DIGITAL DEVELOPMENT WITH DONORS, PARTNERS AND THE GOVERNMENT

The international development community can convene and host roundtables on the Principles for Digital Development. While this is best done in coordination with targeted technical assistance, it is a low-cost effort that can encourage others to align their activities with these principles.

A digital development coordination group consisting of donors, government entities, foundations, and implementing partners could make a lasting contribution by addressing issues around interoperability, standards, and risk assessment.

4. EXPAND CONNECTIVITY TO THE LAST-MILE WITH INFRASTRUCTURE FINANCING REFORM AND NEW CONNECTIVITY TECHNOLOGIES

Although connectivity has expanded in Libya, people living in sparsely populated or rural areas are still at risk of being left behind. The international development community can help reduce inequalities and digital divides by expanding access to electricity and the internet in last-mile and rural areas, supporting SDG 10 (reduce inequalities). Supporting a strong digital foundation can spur development in areas of economic empowerment, citizen engagement, and governance. A number of approaches could be possible:

A. Connect key stakeholders: The donor community can help identify the right partners across the public and private sectors to co-design a sustainable, low-cost, and innovative way to provide electricity and internet connectivity.

B. Conduct feasibility studies on new connectivity technologies: The first step to supporting new and innovative projects is determining whether they will work in the Libyan context. Innovations to explore include:

- Explore Fixed Wireless Access (FWA) provision: LPTIC has expressed interest in exploring 5G FWA options to expand connectivity to the last-mile, and international development actors could partner with them on a feasibility study or technical advisory services.
- Learn from others: Microsoft provides an example of how larger private institutions have partnered with local companies to deliver connectivity solutions for the last-mile. The Microsoft Airband-supported Veriown project in India provides electricity and internet connectivity through a single device using solar energy in areas without access to a power grid. Consumers have access to educational content, news, and entertainment through the Veriown device.

  The donor community could support a feasibility study to understand whether such a project is suitable for Libya. The international development community could build on its strong partnerships to play a convening role in bringing together institutions like LPTIC, Microsoft Airband, and other necessary players to implement such a project.

5. SUPPORT INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) WORKFORCE DEVELOPMENT THROUGH UNIVERSITY PARTNERSHIPS AND UPSKILLING INITIATIVES

The international development community can strengthen the building blocks for a skilled digital talent pool, helping to achieve SDG 8 (decent work and economic growth).

A. Support the improvement of university curricula: Connect universities with institutions that can advise them on how to upgrade ICT curricula. Ericsson's Connect to Learn initiative can provide competency building. Local organizations like SheCodes or Elham Education that have experience in building out programming curricula can provide their expert knowledge.

B. Train and upskill those already in the workforce: If LPTIC's ICT Academy continues under the new Governing Board, the donor community can build connections with technology experts in international companies and universities. In addition, it may be possible to connect the ICT Academy with local CSOs and trainers who have cultural and institutional knowledge. Interviewees suggested that Libyan government organizations sometimes prefer working with foreign institutions rather than local organizations. Partnership with an international donor agency may open doors for local organizations.

6. COUNTER ONLINE DISINFORMATION BY PARTNERING WITH LIBYAN CHANGE AGENTS AND ENGAGING PLATFORM COMPANIES

The international development community can help mitigate and reduce harms resulting from misinformation, hate speech, and digital rights violations in ways including:

A. Engaging a broad community to stand up and speak out: The donor community can coordinate to support Libyan change agents, thought leaders, government officials, civil society, universities, and other governments to call for a halt to hate speech, violence, and manipulation of online platforms.

Platform companies such as Facebook, Google, and Twitter shape how Libyans obtain and use information. These organizations have the power to change the way information flows online and to address their own role in enabling misinformation to flourish. Social media platforms have begun to take misinformation seriously, but devote fewer resources to small market countries like Libya. Platform-led accountability initiatives (such as Facebook's Community Standards Enforcement Report and Fact Checking Program) have grown in response to increased public awareness and pressure, but more is needed. It is not easy for CSOs to be heard by platform companies. The USG can broker a conversation around Libya-specific issues to improve accountability and encourage platforms to increase their awareness of the local context and resources dedicated to managing online misinformation.

B. Support resilience to disinformation through civic education and public media literacy: IREX's Learn to Discern (L2D) is a worldwide media literacy training project for all ages that focuses on developing healthy information engagement habits and increasing the local demand for quality information. Its approach and curriculum are designed to meet the current needs of media consumers, adapting to the local context. L2D has been used in Indonesia, Jordan, Serbia, Tunisia, Ukraine, and the United States to address challenges stemming from misinformation, disinformation, propaganda, and influence campaigns.

7. PROMOTE RECONCILIATION BY LEVERAGING CITIZEN JOURNALISM AND LIBYA'S STORYTELLING CULTURE ON SOCIAL MEDIA PLATFORMS

The international development community can promote positive online interactions leveraging the popularity of social media platforms to bring people together.

A. Promote reconciliation by expanding successful initiatives: The international development community such as USAID and UNSMIL already have programming to leverage digital tools for engagement. This work could be expanded to leverage Libya's storytelling culture and support citizen journalists in combating mis-, dis-, and malinformation; empower local communities; and highlight local knowledge. As the Digital Principle understand the existing ecosystem recommends, programming should aim to be locally relevant and adaptive. The objective of these activities is to build channels for citizen community engagement across groups and with the local government to promote reconciliation and decrease drivers of conflict. Digital engagement is an enhancement of in-person activities and a counterpoint to negativity from disinformation and hate speech.

8. BOLSTER DIGITAL GOVERNMENT INITIATIVES THROUGH RESEARCH, INTERGOVERNMENTAL EXCHANGES, DONOR COORDINATION, AND EMBEDDED TECHNICAL ADVISORS

Several government institutions are ready and eager to embark on digitalization initiatives and welcome donor support. Aligning this need with resource realities, the donor community could provide coordinated, targeted assistance to improve the enabling environment for digital government initiatives, enhancing

investments made by the Government of Libya and other assistance providers. The international development community could support change management and build trust in digital systems among government leaders and officials.

A. Conduct research or facilitate strategic exercises to support the enabling environment: The donor community should explore with the Government of Libya the most helpful intervention to support their digitalization plans, supporting the Digital Principle to understand the existing ecosystem. Possibilities include a government staff capacity assessment to identify digital skills gaps or pain points faced by government employees; a strategy process for a comprehensive view aligning the target e-government initiative with other digital government initiatives; research on relevant examples of successful digital government initiatives to build trust and motivation; or creation of change management and communications plans.

B. Support donor initiatives: The donor community can coordinate and support each other's digital government-aligned projects to ensure interoperability and integration of the Principles for Digital Development. Such an initiative is supportive of both the Digital Principle to be collaborative and SDG 17 (partnerships for the goals).

9. ENSURE THAT HNEC'S FUTURE PLANS FOR BIOMETRIC VOTER REGISTRATION ACCOUNT FOR HUMAN RIGHTS AND PRIVACY ISSUES

Looking beyond the postponed elections, the international development community should remain engaged in HNEC's plans for biometric voter registration, with attention to both the technical and human rights aspects of this initiative.

A. HNEC Biometric Voter Registration—advocate for consultative, open approach: The international development community should build a coalition of donors, education and research institutions, civil society groups, and government champions that are well versed in digital rights to advocate at appropriate forums (or create a forum) for an open conversation about how citizen data will be collected, used, shared, and stored. Recommendation 11 discusses the creation of organizations that could be venues for this dialogue.

B. Provide targeted technical assistance to HNEC: Development assistance can support HNEC in acquiring the planning, research, consultation outreach, and IT support it will need to develop a biometric system aligned with the Principles of Digital Development. Support should provide a learning-by-doing experience on how to design and implement new policies through an evidence-based, open, consultative process as a model for future government digital initiatives. The embedded technical advisor suggested in the previous recommendation can potentially provide this assistance.

10. SUPPORT LEGAL REFORMS TO PROMOTE DIGITAL DEVELOPMENT AND THE PROTECTION OF HUMAN RIGHTS ONLINE

One of the biggest barriers to digital development in Libya is the inability to pass new laws due to shifting priorities amidst the conflict. While some reforms may need to wait for improved security and political conditions, the international development community can provide expertise in drafting or updating digitally relevant legislation and regulations and encourage an inclusive multistakeholder process.

A. Advocate for inclusion of digital language in laws and regulations: The international development community can work together to consistently deliver messages in support of online freedom of expression, privacy, and protection of human rights online. This can be coordinated with and leveraged through the suggested round tables on Principles for Digital Development under the third recommendation.

B. Advocacy for Ministries drafting digitally relevant legislation to use a collaborative process: As new laws and regulations are being written, the Government of Libya has a responsibility to gather input from the private sector and civil society. The international development community can work together to message the importance of consultation and collaboration in the revision of Libya's digital legal framework.

C. Provide targeted technical assistance: The international development community can provide targeted technical assistance to regulatory bodies such as GIA to ensure that digitally relevant language in draft laws and regulations is up-to-date and in line with international standards. The embedded technical advisors suggested above could provide this kind of assistance in their ministries.

11. PROMOTE COORDINATION THROUGH A MULTISTAKEHOLDER INTERNET GOVERNANCE FORUM AND A GOVERNMENT-WIDE OFFICE OF DIGITAL INITIATIVES

Libya would benefit greatly from organizing bodies that can serve as central points of contact to leverage in-country expertise and foster collaboration and coordination. To address this need, the international development community can consult with stakeholders about the ideal mechanisms for coordination and collaboration, learning and leading the community to create forums appropriate to the Libyan context. Interview findings suggest two clear needs:

A. Advocate for a multistakeholder internet governance body, such as a country-level Internet Governance Forum (IGF) initiative: This body should be composed of government and non-government participants on equal footing to discuss public policy issues related to the Internet. It can be a venue for discussing the Principles for Digital Development and the right co-regulation balance to preserve internet freedoms while protecting against abuses and disinformation. The international development community can use its convening power to engage each part of the digital ecosystem with a stake in IGF-related issues and ensure that it is representative of all of Libya (further supporting the Digital Principle encouraging increased collaboration). It may be useful to begin this conversation through NGOs such as the Libyan Organization for Information and Communication Technology which recently brought government and non-government actors together to discuss internet policy issues.

B. A central government point of contact, such as an Office of Digital Initiatives: Digital initiatives are currently scattered across different parts of the government and state-owned enterprises. An Office with reach into these various bodies could streamline multiple digital initiatives and promote interoperability and consistent high standards. This office would be the counterpart to many of the DECA recommendations on messaging, advocacy, and collaboration. The creation of a new body can be a large investment and has high risk for adding to an already bureaucratic structure. These risks can be addressed through government buy-in, a clear mandate, and support from the highest levels of government.

12. PROMOTE INCLUSION AND TRANSPARENCY IN CBL'S DIGITAL FINANCE REFORM EFFORTS THROUGH SUPPORT TO STRATEGY AND PUBLIC COMMUNICATIONS EFFORTS

The international development community can partner with other stakeholders to support the CBL to:

A. Prepare and commit to a strategic framework to improve financial services for all: A strategic framework would help CBL define concrete goals and align digital finance measures with larger policy goals. Jordan went through a similar process in 2016-17, with support from GIZ. One key outcome of this process could be to improve the quality and availability of data on Libya's digital finance ecosystem.

B. Communicate the framework and also their new payments project successfully to the public (and to other key policymakers): To repair public trust in the financial system, it will be important for the Libyan public to understand how the CBL's digitalization plans will affect their lives. This can dovetail with broader efforts around digital literacy and public awareness of digital rights and cybersecurity. CBL's e-payment strategy study recommends that they communicate changes to all stakeholders in the e-payments industry. This will include ensuring that DFS providers and other businesses understand how to interface with the updated National Switch, and how it will enable them to build more interoperable products. The international development community could support this effort by fostering dialogue between CBL and other financial inclusion stakeholders.

13. ESTABLISH CAPACITY BUILDING AND PEER LEARNING MECHANISMS FOR THE CBL DRIVEN BY BEST PRACTICES AND REGIONAL EXAMPLES

CBL's digitalization agenda has already leveraged peer learning as a tool for policy development. The MENA region has an abundance of informative examples, particularly in Jordan and Morocco. Many interviewees expressed concerns that the regulator lacks technical expertise and familiarity with new technologies. A multistakeholder working group could support CBL by bringing in other development actors such as the World Bank, the Alliance for Financial Inclusion, GIZ, and the International Monetary Fund (IMF).

To accompany the CBL in this capacity building work, the donor community can support them (and other policymakers) to:

A. Guide a new strategy reforming Moamalat and the National Switch: The CBL is considering opening up partial ownership of the National Switch to other banks. If this happens, CBL will maintain a majority ownership role and monitor and enforce overall vision for the national payments scheme. The international development community can work with other stakeholders to ensure that the updated National Switch follows global standards and best practices for design and governance. It may be helpful for this support to be guided by a focused political economy analysis that would uncover hidden obstacles to reform. Such an analysis could examine CBL's legal and regulatory authorities regarding Libya's payments system, supervisory approach to the safety and efficiency of payments, and institutional readiness to serve as a market overseer and facilitator.

B. Join the Alliance for Financial Inclusion (AFI): The members of AFI include central banks and other financial regulatory institutions from more than 90 developing countries, including Egypt, Morocco, and Tunisia. AFI members have pioneered innovative policy approaches to extend the financial system to the unbanked, while maintaining safety and stability. Member institutions set the agenda for the AFI network by choosing the policy solutions to focus on and the modes of cooperation and knowledge sharing that suit them best.

Peer learning is critical to AFI's approach to knowledge generation and policy development. By sharing practical knowledge and experiences, member countries guide one another in best practices that can be adapted in their own context.

C. Build out the National Payments Council: The National Payments Council is chaired by the governor of the CBL. Its members are stakeholders with an interest in electronic payments, including banks, insurance companies, ministries, and telecom companies. The Council serves as a technical resource and a forum to provide inputs into the policymaking process. Under Libya's larger electronic payments strategy, the international development community can support the National Payments Council to use peer learning

examples. This could include thematic working groups that focus on specific policy areas under a larger national financial inclusion strategy.

The central bank of Jordan established working groups for each key thematic area under their national strategy, including one for Digital Finance. These working groups are intended as an environment for knowledge sharing and learning, rather than as a political environment. Development partners can be invited to join such working groups, particularly when they can share examples from their work in other countries. A working group can also provide an opportunity for learning trips or visits from other country regulators or technical specialists.

The National Payments Council should be composed of diverse stakeholders. Interviewees at the CBL shared that no FinTechs had been invited to participate—other key stakeholders may still be invited. The international development community can support the Council, guiding it to follow best practices, peer learning examples, and the Principles of Digital Development.

14. SUPPORT THE CBL IN FACILITATING THE SHIFT TO ELECTRONIC PAYMENTS AND IN IMPLEMENTING THE NEW NATIONAL PAYMENT SYSTEM PROJECT

Libya's dysfunctional interbank network diminishes the value of digital payment tools and constrains the growth of the digital economy. DFS providers are tied to the banking system and struggle to provide what the economy needs: a retail payment system with speedy, interoperable transactions for low value amounts, wide acceptance and accessibility, and adequate security.

The international development community can support the CBL in implementing their digital transformation strategy for the banking sector, promoting a system that is open, interoperable, and reliable. This can include:

A. Supporting the deployment of a retail payment system: A retail focus will help CBL's shift to digital payments serve consumers, robust private sector engagement, and affordability. An improved retail payments system will help meet the needs of average Libyan consumers and merchants, catalyze e-commerce, and support the digitalization of MSMEs.

B. Scaling merchant uptake and promoting interoperability of electronic payments: A well functioning retail payments system requires widespread digital payment acceptance points. Interoperability between different e-wallet systems is critical for broadening payment acceptance. When payments are interoperable, it reduces barriers to adoption by informal online sellers, who are primarily women. The international development community can support Libya on a path to an interoperable DFS ecosystem through technical support and by leveraging the expertise of development partners like CGAP and the Gates Foundation.

Following USAID's E-PESO project with the Philippines' central bank to strengthen the national ecosystem for digital payments, a study found that the share of digital payments increased from one percent in 2013 to 11 percent in 2018. This support has played an important role in the country's journey toward a cashless economy.

C. Supporting development of a regulatory innovation facility: For most regulators in emerging economies, keeping up with the fast pace of innovation is extremely challenging. This is particularly true when regulators lack resources and staff with the technology skills to understand FinTech's rapid development.

Innovation facilities can help regulators learn about the latest market developments and enhance their capacity to make informed policy decisions. They also provide an important feedback channel that helps

market players better understand and align with regulator intentions and policy. The two most popular types of innovation facilities are innovation hubs and regulatory sandboxes.[114]

The CBL is working on a regulatory sandbox for FinTechs. If the CBL chooses to pursue this effort, the international development community can help to ensure that its approach and process will advance its policy objectives, such as facilitating responsible innovation in FinTechs and fostering greater competition. These objectives should not divert attention from fundamental priorities, like strengthened supervisory capacity, implementation of a risk-based approach to AML/CFT, and basic regulatory enablers for digital finance and electronic payments. Sandboxes and similar innovation facilities will be most effective once these foundational issues have been addressed. This should be seen as a follow-on to basic reforms, not as a substitute for reforms.

» USAID supports CGAP in its work on regulatory innovations and evidence gathering. Evidence can assuage (or confirm) regulatory concerns about the impact of innovations, allowing beneficial innovations to reach the marketplace.

» A 2020 report by USAID/Pakistan outlines a roadmap for the development of regulatory sandboxes, together with the State Bank of Pakistan. It describes motivating principles for a regulatory sandbox, unpacks legal issues and implementation considerations in the Pakistani context, and outlines a risk management approach. While considerations in Libya will be different, the experience in Pakistan could provide a starting point for USAID engagement with CBL's sandbox plans.

114 A regulatory sandbox is a controlled, live virtual testing environment for innovators (existing and startups) to test new ideas with real customers within a defined timeframe. It allows the regulator to oversee trials using a customized regulatory environment for each pilot.

Appendices

A. DEFINITIONS

Definitions from USAID Digital Strategy 2020–2024 unless otherwise mentioned.

Affordability: Affordability is based on whether a person can afford the cost of data relative to their income and is measured as gigabytes (GBs) of data per percentage of monthly income. The Alliance for Affordable Internet (A4AI) uses a "1 for 2" measure for affordable internet—where 1 GB of mobile broadband data is priced at 2 percent or less of average monthly income.

Artificial Intelligence (AI): The science and technology of machines that perform activities normally thought to require human intelligence. One subset of AI is Machine Learning (ML), a technique in which computers "learn" to recognize patterns in existing data, creating systems that can be more flexible, responsive, and adaptable than previously possible. Some AI systems use computers to automatically make decisions, while others create recommendations for human decision-makers.

Blockchain: Blockchains are an example of a distributed ledger technology (DLT), a type of shared, peer-to-peer computer database that enables all network participants to agree on a set of facts or events without needing to rely on a single, centralized, or fully trusted intermediary party. Blockchains are the most common form of DLT, and require data on the "chain" to be structured in linked, sequential "blocks."

Censorship: The suppression of free speech by governments or private institutions based on the assumption that said speech is objectionable or offensive. In addition to hard forms of censorship (handed down officially through laws and regulations), soft forms of censorship exist (applied through financial and/or reputational pressure).

Civil Society Organizations (CSOs): CSOs include formal non-government organizations (NGOs) as well as formal and informal membership associations (including labor unions, business and professional associations, farmers' organizations and cooperatives, and women's groups) that articulate and represent the interests of their members, engage in analysis and advocacy, and conduct oversight of government actions and policies.

Cyber Hygiene: The practices and steps that users of computers and other devices take to maintain system health and improve online security. These practices are often part of a routine to ensure the safety of identity and other sensitive details that could be stolen or corrupted.

Cybersecurity: The prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and non-repudiation.

Data Privacy: The right of an individual or group to maintain control over and confidentiality of information about themselves. Data privacy can be at risk from unintentional sharing as well as from undue or illegal gathering and use of data about that individual or group.

Data Protection: The practice of ensuring the protection of data from unauthorized access, use, disclosure, disruption, modification, or destruction, to provide confidentiality, integrity, and availability.

Digital Divide: The distinction between those who have access to the Internet and can make use of digital communications services, and those who are excluded from these services. There are multiple and overlapping digital divides, stemming from inequities in access, literacy, cost, or the relevance of services. Factors such as high cost and limited infrastructure exacerbate digital divides.

Digital Ecosystem: The stakeholders, systems, and enabling environment that together empower people and communities to use digital technology to gain access to services, engage with each other, or pursue economic opportunities. Although certain aspects of the digital ecosystem have country-wide reach, other features differ across geographies or communities. USAID's framework for understanding the digital ecosystem is structured around three pillars: Digital Infrastructure and Adoption; Digital Society, Rights, and Governance; and Digital Economy.

Digital Financial Inclusion: The use of digital technology to reach financially excluded and underserved populations with a range of formal financial services that are suited to their needs and are responsibly delivered to customers and sustainable for providers.

Digital Financial Services (DFS)/FinTech: Financial services enabled by or delivered through digital technology (e.g., mobile phones, cards, the internet). These services (e.g., payments, credit, insurance, savings, advisory) can be offered by a range of providers, from banks to a host of non-bank financial institutions, such as microfinance institutions, digital credit providers, payment providers, technology vendors, and electronic money issuers.

Digital Government: Digital government refers to the use of digital technologies as an integrated part of government modernization strategies to create public value. This includes how the government manages internal IT processes and systems, delivers citizen- and business-facing e-services, and engages with the public through digital channels. Digital government is often used interchangeably with terms like e-governance and e-government.

Digital Identity: Identity is defined as a set of attributes that uniquely describes an individual or entity. Digital identification (ID) systems often require registering individuals into a computerized database and providing certain credentials associated with each individual (e.g., birth certificates, identifying numbers, cards, digital certificates, etc.) as proof of identity. Digital ID systems sometimes use biometrics (fingerprints, iris scans, etc.) to identify individuals, but many advanced systems do not. Government actors can set up these systems to create foundational, national ID programs, or donors or non-governmental organizations (NGOs) can use them to identify beneficiaries, e.g., for humanitarian assistance and service-delivery.

Digital Literacy: The ability to obtain, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital devices and networked technologies for participation in economic, social, and political life. This may include competencies that are variously referred to as computer literacy, information and communication technology (ICT) literacy, information literacy, and media literacy.

Digital Payments: Payments initiated or received by electronic means. For an end user, these payments might be made via a text message, mobile application, website, or merchant-level point-of-sale device, such as a dongle or QR code. A financial institution (e.g., bank, switch, MFI, or PSP) might facilitate these payments to or from

a range of instruments including: prepaid wallets (i.e., electronic money accounts), cards, transaction or bank accounts, and other instruments that serve as stores of value and permit payments.

Digital Repression: Digital repression refers to the use of digital tools and technology to suppress internet freedoms and includes five techniques: surveillance, censorship, social manipulation and harassment, internet shutdowns, and targeted persecution of online users. This term can include offline actions taken to penalize online speech (e.g., arrests, physical violence), as well as online actions that seek to suppress freedoms in both online and offline spaces.

Digital Rights: the fundamental rights and freedoms that individuals are able to exercise online,[115] as well as a respect for privacy and ownership of data.[116]

Digital Trade: The delivery of products and services over the internet by firms in any industry sector, and of associated products such as smartphones and Internet-connected sensors.

Disinformation: False information that is deliberately created or disseminated with the express purpose of causing harm. Producers of disinformation typically have political, financial, psychological, or social motivations.

E-commerce: An electronic commerce, or e-commerce transaction is defined as the sale or purchase of goods or services conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders.

Emerging Technologies: Ethical, policy, and regulatory frameworks struggle to keep pace with the rate of progress in emerging technologies. Emerging technologies often lack rigorous testing in the real world, so their implications on people and societies remain less understood. These include artificial intelligence (AI), the internet of things (IoT), blockchain, drones, and 3D printing. As these technologies become more affordable and widespread, they may have a significant impact on digital ecosystems and on development.

Information and Communications Technology (ICT): Diverse set of technological tools and resources used to transmit, store, create, share, or exchange information. These include computers, the internet (websites, blogs and emails), live broadcasting technologies (radio, television and webcasting), recorded broadcasting technologies (podcasting, audio and video players and storage devices) and telephony (fixed or mobile, satellite, visio/video-conferencing).

Interoperability: The ability of computer systems or software to exchange and make use of information from other systems. For example, interoperable data systems allow for data sharing and reuse of common formats and definitions, and interoperable payment systems allow digital transfers of money between financial service providers.

Internet Freedom: The online exercise of human rights and fundamental freedoms regardless of frontiers or medium. When internet freedom is respected, the rights that people have offline are also protected online.

Internet Governance: The development and application by governments, the private sector, and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet.

115 ICCPR Article 19, https://www.ohchr.org/EN/ProfessionalInterest/Pages/CCPR.aspx.

116 ICCPR Article 17, https://www.ohchr.org/EN/ProfessionalInterest/Pages/CCPR.aspx.

Internet Service Providers (ISPs): ISPs include both fixed-line and wireless technologies. Wireless ISPs operate over unlicensed spectrum. ISPs include both small, local services and global providers.

Malinformation: The deliberate publication of private information for personal or private interest, as well as the deliberate manipulation of genuine content. Note that malinformation is based on reality but is used and disseminated to cause harm. An example is a report that reveals a person's sexual orientation without public interest justification.

Media Literacy: The ability to obtain, analyze, evaluate, create and participate with messages in a variety of forms—from print to video to the Internet. Media literacy builds an understanding of the role of media in society as well as essential skills of inquiry and self-expression necessary for citizens of a democracy.

Misinformation: Information that is false but not intended to cause harm. For example, individuals who do not know a piece of information is false may spread it on social media in an attempt to be helpful. Social media platforms are regularly used to spread misinformation. Disinformation is a type of misinformation—disinformation refers to misinformation that is spread with malicious intent.

Mobile Money: A technology that enables people to receive, store, and spend money using a mobile phone. Can also be referred to as a mobile wallet or e-money.

Mobile Network Operators (MNOs): MNOs offer cellular voice and data services, and provide internet services through wireless technologies, operating over licensed spectrum. Many companies, such as Telekom Srbija, are both an ISP and an MNO because they offer both fixed and mobile internet services.

Spectrum: Refers to different frequencies of electromagnetic radiation. Regulators designate specific frequency ranges (or bands) for different purposes, including telecommunications. Some bands (e.g., WiFi) are unlicensed, meaning that anyone can use them with the proper equipment. Licensed spectrum requires a regulator's approval to broadcast (e.g., cellular networks or FM radio). Licenses are typically allocated through spectrum auctions.

B. SELECTED RESOURCES FOR RECOMMENDATIONS

In addition to the resources hyperlinked in Section 3, this Appendix lists resources that may be useful for activity design or general awareness.

Strengthen cybersecurity capacity through civil society engagement, workforce development, and procurement reform

- Civil Society Innovation Initiative (CSII) Fact Sheet
- Cybil Portal: The online knowledge portal for the Global Forum for Cybersecurity Expertise (GFCE). It provides a repository on past and present international cybersecurity capacity building projects. It also includes tools to help with design of cyber capacity building projects.

Counter online disinformation by partnering with Libyan change agents and engaging platform companies

- USAID Disinformation Primer
- Balancing Act: Countering Digital Disinformation While Respecting Freedom of Expression
- VoxUkraine uses a scientific analysis method to assess major economic and political processes and decisions in Ukraine. A key project by the Vox team is VoxCheck, a fact-checking service that identifies disinformation narratives being spread online.
- Data Analytics for Social Media Monitoring: Guidance on Social Media Monitoring and Analysis Techniques, Tools and Methodologies

Use social media platforms to promote reconciliation by leveraging citizen journalism and Libya's storytelling culture

- USAID/Ukraine's Decentralization Offering Better Results and Efficiency (DOBRE) E-platform for local communities to increase public access to development investment tools and civic participation mechanisms.
- USAID/Mali utilized mobile phone hotlines to gather citizen input and feedback on its programming to promote reconciliation.
- Estonia, Taiwan, and Brazil have examples of government dialogue initiatives.

Bolster digital government initiatives through research, intergovernmental exchanges, donor coordination, and embedded technical advisors

- USAID/Ukraine's Transparency and Accountability in Public Administration and Services (TAPAS) activity helped develop new e-services for numerous state agencies. TAPAS' technical assistance to the government helped it to develop and launch a government portal and a mobile app as an electronic single window to provide citizens and businesses with convenient access to state e-services.
- USAID/Philippines has supported the government's digital health initiatives. Its TB Innovations and Health Systems Strengthening (TBIHSS) activity introduced AI and digital technology for reading tuberculosis chest X-rays in regional hospitals. USAID's Medicines, Technologies and Pharmaceutical Services (MTaPS) activity supports the Department of Health's transition from a paper-based logistics system of data management to an electronic system for faster and more accurate reporting of supply chain data. USAID's Human Resources for Health (HRH2030) activity (active in 12 countries including Jordan, Mali, and the

Philippines) has worked with the Department of Health to implement and scale up an e-learning initiative. The Department of Health Academy's e-learning portal is the first of its kind in the Philippines.

Ensure that HNEC's future plans for biometric voter registration account for human rights and privacy issues

- Identity in a Digital Age: Infrastructure for Inclusive Development (USAID)
- Civic Space Page on Digital IDs
- Principles on Identification for Sustainable Development (World Bank)
- Introducing Biometric Technology in Elections (2017) by the International Institute for Democracy and Electoral Assistance, which includes detailed case studies on e-voting in Bangladesh, Fiji, Mongolia, Nigeria, Uganda, and Zambia.
- Biometrics Institute's 7 Ethics Principles for Biometric IDs

Digital Rights and Data Protection

- Civic Space Tech modules relate to regulatory frameworks and international standards for digital freedoms and responsibilities
- National Data Protection and Privacy Legislation Worldwide (UNCTAD Database)
- Creating a data protection framework: A do's and don'ts guide for lawmakers (AccessNow)
- OECD Guidelines on the Protection of Data and Transborder Flows of Personal Data

Promote coordination through a multistakeholder internet governance forum and a government-wide Office of Digital Initiatives

- The Internet Society has resources for starting a national IGF and applications for funding are currently open to share with stakeholders.
- The International IGF Wikipedia page has links to relevant examples of national IGFs.

Establish capacity building and peer learning mechanisms for the CBL driven by best practices and regional examples

- PAFI Report in the Fintech Era from 2020, produced by the Committee on Payments and Market Infrastructures (CPMI, at the Bank of International Settlements) and the World Bank, and other resources produced by the PAFI task force.
- CGAP's technical guide: Building Faster Better: A Guide to Inclusive Instant Payment Systems, 2021.
- CGAP resources on Interoperability including How can funders promote interoperable payments?)
- The Gates Foundation The Level One Project Guide
- Better than Cash Alliance The State of Digital Payments in the Philippines Executive Summary (2019)
- Building Resilient and Inclusive Digital Ecosystems: A Toolkit for Using Digital Payments in Development Programs (USAID)
- USAID FinTech Partnerships Playbook

Support the CBL in facilitating the shift to electronic payments and in implementing the new national payment system project

- Presentation by Matthew Saal, World Bank: Fostering Financial Innovation: Sandboxes, Innovation Office, Incubators and Accelerators (2019).
- The FinTech Working Group of the United Nations Secretary-General's Special Advocate for Inclusive Finance for Development (UNSGSA) and Cambridge Centre for Alternative Finance (CCAF) at the University of Cambridge documented and shared lessons learned on regulatory initiatives for FinTech with an emphasis on financial inclusion.
- The World Bank's FinTech Note No.4 How Regulators Respond to FinTech Evaluating the Different Approaches—Sandboxes and Beyond offers regulators a particular focus on the roles of innovation facilitators which include regulatory sandboxes, regulatory accelerators, and innovation offices.
- World Bank: How Regulators Respond To FinTech : Evaluating the Different Approaches – Sandboxes and Beyond (2020).
- Cenfri Regulating for innovation: A supervisory toolkit: A toolkit to help regulators navigate their role and guide decisions in regulating for innovation.

C. METHODOLOGY

The Libya DECA included three components:

1. **USAID/Libya engagement:** USAID/Libya designated a Mission DECA Team with participation from the Libya External Office (in Tunis) and the Middle East Regional Platform (in Frankfurt). The USAID/Libya DECA team helped identify stakeholders; reviewed relevant documents during planning, key informant interviews, and analysis and report-writing stages; and attended selected interviews during the interview phase.

   The Mission DECA Team also helped organize a presentation with USAID/Libya midway through the virtual interviews. These meetings were important to socialize the DECA purpose and preliminary findings across various USAID/Libya technical offices.

   This engagement was not only important for ensuring an appropriate mix of interviewees, but was critical to building the research team's understanding of USAID/Libya's priorities.

2. **Desk research:** This research used a standardized template organized around three pillars (digital infrastructure and adoption; digital society, rights, and governance; digital economy). The research included three components: 1) review of USAID/Libya's strategic plan, funding allocations, and digitally relevant programming; 2) quantitative analysis of open-source data and indices to produce regional comparisons (e.g., GSMA, World Economic Forum, International Telecommunication Union); and 3) internet research guided by high level questions under each pillar about the state of Libya's digital ecosystem.

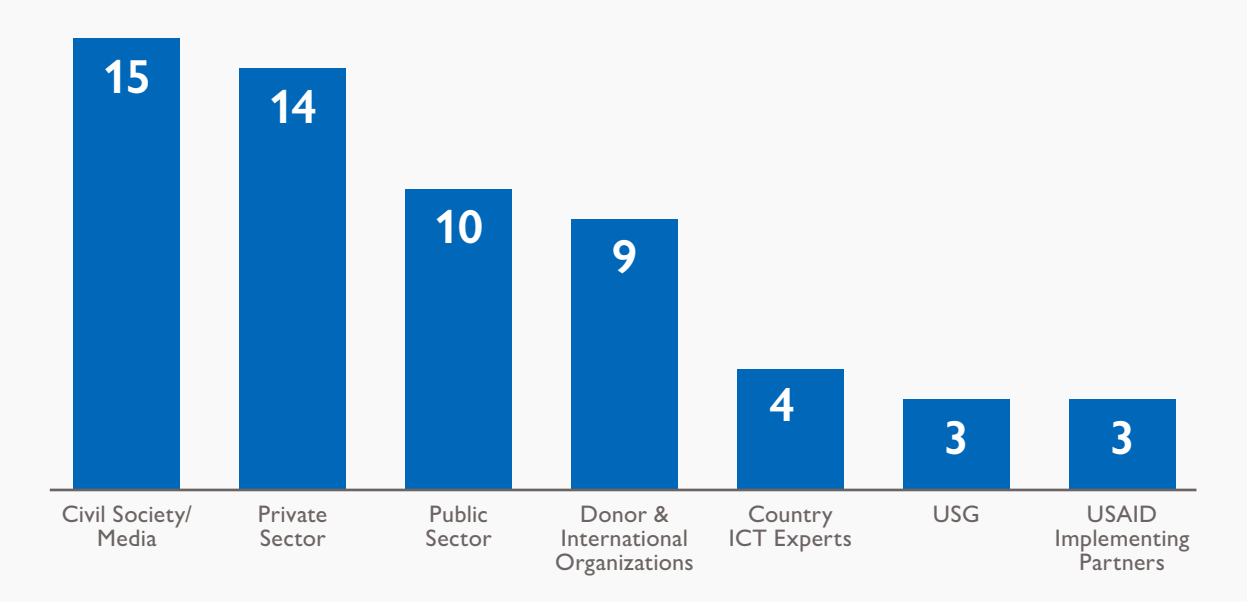
   The research team shared the desk research with the USAID/Libya DECA Team before interviews and used it to inform the interview guide questionnaires.

3. **Interviews:** The research team collaborated with USAID/Libya to compile a list of target stakeholders across civil society, academia, international organizations, the private and public sectors, and within USAID/Libya. Initial key informant interviews were secured through the DECA team and USAID/Libya networks. Additional interviewees were added throughout the research process using referrals from completed interviews.

   During the interview phase, the DECA team conducted anywhere from one to four virtual interviews per day. This was adjusted to maximize interviews given the six-hour time difference. Most interviews were attended by at least two team members, with a lead interviewer and a notetaker. To best triangulate findings and to test different interview styles, team members switched partners for each interview. Each interviewee was asked a general set of questions, which were developed prior to the interview phase and refreshed based on learnings from previous interviews.

   To ensure a diverse mix of interviewees, the research team evaluated the list of scheduled interviews and conducted additional outreach in an attempt to fill identified gaps. The graph below and Appendix D shows the 58 interviews by sector (informed by 19 female interviewees, and 55 male interviewees).

FIGURE 11: Interviews, by stakeholder group



Analysis

During the eight weeks of interviews, the DECA team conducted debriefs twice a week. These meetings ensured that all team members were briefed on each interview, and facilitated the triangulation of emerging themes that could then be tested in subsequent interviews. Midway through the interviews, the team identified primary themes and began preliminary synthesis of findings. Upon completing the key informant interviews, the team convened to revisit these themes, confirmed their validity against interview notes, and organized the findings around the three pillars outlined in this report (digital infrastructure and adoption; digital society, rights, and governance; and digital economy).

Limitations

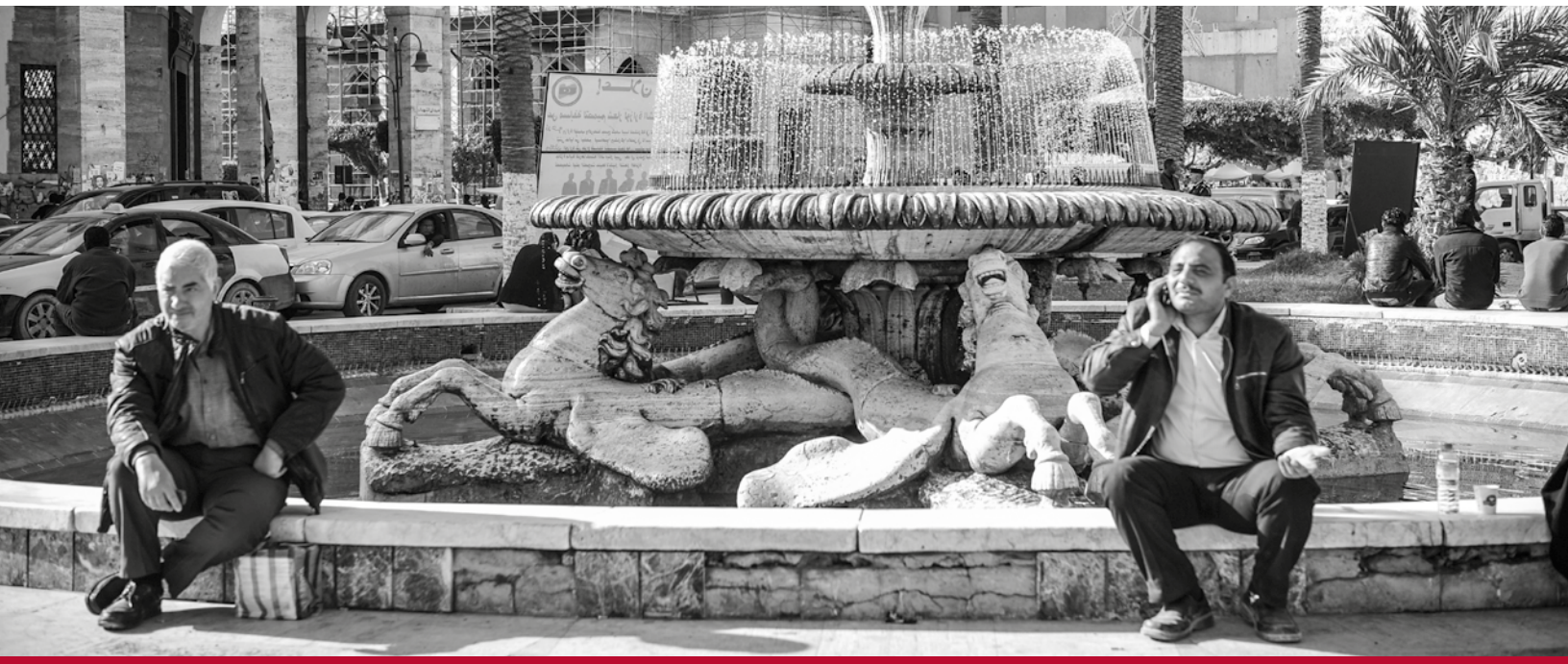
The research team was limited, to an extent, by their technical expertise. DECA team members were chosen to provide coverage of key technical areas identified in a preliminary review. This may introduce some bias—weighting the specializations of team members more heavily than other possible areas.

USAID/Libya and DECA team networks selected a large number of interviewees, an approach that may have excluded stakeholders who are less comfortable engaging with USG representatives. Information is mostly limited to Tripoli or Benghazi-based interviewees' knowledge and work across the country. Rather than rigorous qualitative methods (e.g., thematic coding), analysis of interview notes depended on triangulation of findings within the DECA team, which attempted to balance thematic gaps by consulting technical experts and seeking additional interviewees.

The first half of the interviews were conducted during Ramadan, which may have excluded stakeholders who were observing the Islamic holy month.

Research team

The DECA team was composed of five digital development generalists and specialists with technical expertise in governance and digital finance. Team members who were technical experts attended most interviews that were relevant to their expertise.



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